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UNIVERSITY OF ALBERTA

Migration Decision-Making: A theoretical and empirical study

by

Yihua Lou Lin-Yuan

A thesis
submitted to the Faculty of Graduate Studies and Research
in partial fulfillment of the requirements for the degree
of Doctor of Philosophy

Department of Geography

Edmonton, Alberta
Spring 1993

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To my parents

Abstract

This research focuses on the behavioral processes of migration decision-making, a relatively neglected topic in the recent migration literature. The main theoretical contribution of the study centers on the construction of a descriptive model of individual migration decision-making, based on the idea of search for dominance. Individual perceptions of risk and the way it affects the choice decision of potential migrants are addressed as important issues in the decision-making process.

In addition to the theoretical construction of the model, an empirical test is designed to find out whether the model has reflected the migration behavior in the real world. A self-administered questionnaire survey was conducted between August and December 1991 in Edmonton. The sample consisted of Chinese immigrants from several Asian countries, mostly from Hong Kong, who emigrated to Canada between 1985 and 1990. The empirical survey also aimed to understand the Chinese immigrants in terms of their motivations for migration, specific reasons for coming to Canada, constraints of emigration they have encountered and their major sources of information regarding emigration.

The research has revealed that most migration decision-makers acted within their "bounded rationalities." Proofs were found in their (1) limited ability to perceive information—they considered only a few alternative destinations and consulted only a few sources of information. Their search was incomplete and biased towards what they thought was important and the newly obtained information was used for checking information that had previously been stored in their memories, or for justifying their preferences for a place, and (2) limited ability to utilize information—instead of maximizing place utility, they used other less rational decision rules. Non-compensatory rules were used more often than compensatory rules. After all, the migration decision-makers acted in line with the psychological model of search for a dominant structure. They showed intentions to find the most promising destination, usually the one they had assumed to be the best at earlier stages of the decision process and argued favorably for it during the whole process.

Most migration decision-makers could perceive the risks involved in their decisions. When making choices between alternative destinations whose properties were not known for certain, their responses by and large supported *Prospect theory*,

a psychological model of choice under risky situations. Certainty effect, overweighing and underweighing probabilities were easily observed in the choices made by the respondents.

The theoretical model of migration decision-making discussed in this study was useful in explaining the decision-making behavior of the Chinese immigrants in Edmonton. It is believed that, with some modification of the place-related properties entering into decision-makers' evaluative process, the model is applicable to other types of migration, too. However, further testings with other groups of migrants will be required before it can be universally accepted.

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Chapter 1

Introduction

1.1. Motivation

This study is motivated by the apparent shortage in the recent migration literature of research on the decision-making process, especially in the way decision strategies are adopted, information is combined, and in situations in which some of the factors relevant to potential migrants' decisions are not known with certainty. Micro-level studies on migration decision have been focused on **why** an individual decides to migrate (*e.g.*, satisfying/dissatisfying assessment, stresses/motivations for migration) and **what** the final decision is as a result of certain evaluations (*e.g.*, cost-benefit analysis, place utility), while **how** the decision to migrate to a certain place has been arrived at has been largely neglected. At the conceptual level, many scholars agree that migration decision-makers act within their bounded rationality. Yet there is still a lack of theoretical as well as empirical understanding of the cognitive process in which potential migrants seek and evaluate alternative destinations. The process directly leads to their final decisions of where to move or whether to move or not. The process-oriented study also provides the most important clue as to why people belonging to the same socioeconomic group act differently in their migration behavior, which is one of the major drawbacks of macro-level approaches. This is because individuals vary from one another in the way they perceive and respond to the general socioeconomic or environmental factors specified by macro-level studies as determinants of migration. The process-oriented approach, on the other hand, can provide more insight into those issues from the perspective of the individuals.

The element of uncertainty or risk in migration decision analyses has also been ignored by the literature. Most studies, either implicitly or explicitly, treat potential migrants as having full knowledge of both the places of origin and destination.

However, all real decisions are made under uncertainty (Edwards 1984), and so are migration decisions. For example, many potential migrants are unsure about whether or not they could find employment or about the kind of earnings they might reasonably expect at an alternative city or country. They are not certain about the residential environment of the place to which they intend to move. They do not know for sure how much the move will cost them on the one hand and/or benefit them both monetarily and non-monetarily, on the other. They may even be unsure about the true nature of their own abilities and aptitudes. Therefore, most migration decisions are made in an uncertain world. There has also been a gap between understanding individual perceptions of risk and the way risk affects the decisions and actions of potential migrants.

In view of the above mentioned shortages in the contemporary migration research literature, the present study attempts to construct a model of individual migration decision-making that addresses the issues of mental process, risk perception, information search behavior and their interactions.

1.2. Objectives and hypotheses

Behavioralism was introduced to geography by Gilburt White and his followers, notably Robert Kates and Ian Burton (Kates 1962). D. Harvey can be given credit for presenting, in the form that came to be generally accepted, the methodology of science that was adapted by behavioralist geographers. This research takes a behavioralist approach, where the linkage between method and explanation follows the scientific route first described by Harvey (1970; Johnston 1979). Three major steps are involved in the reasoning procedure:

1. to begin with some point established by previous research, formulate hypotheses about the processes in some related pattern of behavior,

2. to design an empirical survey and collect relevant data in order to test the hypotheses,

3. to analyze the collected data to show that the model does, or does not, make it possible to predict the processes or behavior observed.

If the predictions are confirmed, the hypotheses are accepted as being valid. If the predictions are found to diverge from the observations, either the model alone, or the model and the hypotheses must be rejected. Accordingly, three major objectives are identified for the current research:

1. To construct a descriptively sound model of the individual migration decision-making process. Migration decision is seen as a dynamic and multi-stage

decision problem. The model will demonstrate two major characteristics of human decision-making behavior: the way information is perceived and the decision strategies used to process the perceived information. Furthermore, the perception of risk involved in the decision to migrate and the way it affects a potential migrant's evaluation will also be addressed.

The model will deal with the following specific questions:

- What is the sequence of stages through which potential migrants perceive and evaluate alternative destinations, and finally select one as their migration destination? How are various stages in the decision-making process interrelated with one another?
- What decision rules do potential migrants use at each stage of their decision-making process? Are they satisficers or maximizers? Do they make tradeoffs among different goals of migration?
- How do potential migrants search information during their decision-making process in terms of the amount and sources of information consulted? What are the relationships between information search patterns and decision strategies adopted by the decision-makers?
- How do potential migrants perceive the risks involved in their decision-making process? Is numerical probability or non-numerical terms a better expression of their assessment of properties in potential migration destinations? How does this perception of risks affect their evaluation of alternative migration destinations?

Based on the model of search for a dominance structure, hypotheses 1 to 11 are formulated:

Hypothesis 1: Migration decision-makers usually consider only a few place-related properties that they think are important, rather than a complete list of them in evaluating different migration destinations.

Hypothesis 2: Most people consider only a few alternatives within the confines of their mental maps before making their decisions. In other words, potential migrants tend to, from the beginning of the process, focus on the few countries for which they already have a preference before any serious search of information is conducted.

Hypothesis 3: Degree of stress at the place of origin has a direct effect on migration decision strategies adopted. The more dissatisfied a person is with the environment of the origin, the fewer migration alternatives would

be considered, and the shorter time would it take to decide on a migration destination.

Hypothesis 4: Potential migrants tend to choose for further consideration the alternative destinations that could possibly satisfy them with all the goals they expect to achieve by migration (Conjunctive rule: Table 1.1).

Hypothesis 5: Potential migrants tend to discard in subsequent information processing the destinations that, as they see it, could not satisfy them with the most important goals they expect to achieve by migration (Elimination by aspects rule: Table 1.1).

Hypothesis 6: Potential migrants tend to choose those alternative destinations for further consideration that could possibly offer the greatest sum of attractiveness, even though they are not satisfied with all the properties of those alternatives (Addition of utilities rule: Table 1.1).

Hypothesis 7: Potential migrants tend to decide on a destination where at least one of their goals of migration could be achieved while no goals could be achieved in other destinations (Disjunctive rule: Table 1.1).

Hypothesis 8: Potential migrants tend to decide on a destination where their most important goal of migration could be better achieved than in other alternative destinations (Lexicographic rule: Table 1.1).

Hypothesis 9: Potential migrants tend to decide on a destination where at least one of their goals of migration could be better achieved while no other goals could be worse achieved than in other alternative destinations (Dominance rule: Table 1.1).

Hypothesis 10: Potential migrants tend to decide on a destination where more important goals of migration could be better achieved than in any other alternative destinations (Addition of utilities rule: Table 1.1).

Hypothesis 11: Potential migrants tend to decide on a destination where the number of favorable properties is more than the number of unfavorable properties as compared to any other alternative destinations (Maximizing number of attributes with a greater attractiveness rule: Table 1.1).

Based on prospect theory, hypotheses 12 to 17 are formulated:

Hypothesis 12: Potential migrants prefer a certain outcome in a place to the one that is merely probable in another place despite the latter having a larger gain.

Hypothesis 13: When the probability of gaining is substantial, potential migrants prefer the outcome in a place where gaining is more probable despite the one in another place having a larger gain.

Hypothesis 14: When gaining is merely possible but not probable, potential migrants prefer the outcome in a place that offers the larger gain despite the one in another place having a higher probability of gaining.

Hypothesis 15: Potential migrants would choose to accept a high probability loss of larger value at a place rather than a certain loss of smaller value in another place.

Hypothesis 16: When the probability of losing is substantial, potential migrants would choose to accept the outcome in a place where the outcome is less probable, despite the cost of loss involved in the outcome being greater than that in another place.

Hypothesis 17: When losing is not very probable, potential migrants would choose a place with an even less attrctive outcome where that outcome is very improbable, rather than another place with an outcome that is somewhat less unattractive, but more probable.

All these hypotheses are discussed in greater detail in Chapters 7 and 8.

2. To design and conduct an empirical survey that will enable us to verify the theoretical model. A mail survey was conducted in Edmonton, Alberta among a sample of recent Chinese immigrants to Canada. Information relating to alternative destinations considered, decision rules adopted, types of information searched, sources of information consulted, and evaluations of risky place-related properties was particularly sought.

3. To verify the model (hypotheses 1 to 17) statistically based on survey results to see whether it reflects the migration behavior in the real world. If there is any inconsistency between the prescriptions made by the model and the ways people actually behave, a modification will be made to the model. Although the testing is restricted to international migration in this research, it is believed that the model pertains to other types of migration, too. However, replication of the test on other data sets will be left for future studies.

It is hoped that this study can make an effort to systematize knowledge on migration by integrating various lines of inquiry into one analysis of the decision process, and thereby make a contribution to the theory of migration. Shaw (1975) made the point 25 years ago that the major problem associated with contemporary migration research was the lack of systematically accumulated knowledge on the subject. This still remains true. It is believed that process analysis integrates various approaches together to lead to the development of a sophisticated theory of migration "which would lend both elegance and understanding to this large and important subject" (Jackson 1969). The different lines of investigation will be dealt with by the present study include: *migration motivations, value judgement, place utilities, socio-economic factors, push-pull effects and information flows.*

In addition to the theoretical approach, another objective of this study, which is rather practical, is to achieve a better understanding of the populations studied in terms of their socio-demographic characteristics and reasons for migration. Particular issues such as the kinds of stress the Chinese immigrants had felt in original countries and goals expected to be achieved through emigration, their perceptions about Canada *vs.* other alternative migration destinations, and the very reasons they chose to emigrate to Canada instead of other countries will be investigated. Chinese immigrants constitute one of the largest immigrant groups to Canada in recent years. This study intends to enhance the general understandings of this group of people and provide insight into public policy formulations.

1.3. Theories and techniques

The study of migration decision-making has attracted attention from various scientific disciplines, notably geography, psychology, sociology and economics. The present study represents a geographical approach to the process of migration decision-making under risk. It emphasizes the dynamic aspect of the migration decision-making process, the spatial elements and the impact of spatial interactions on the decision process. At the same time, the study tries to draw as much insight as possible from other disciplines, such as psychology and statistical decision theory, using them as essential tools to construct the present decision model.

(1) Expected utility theory.
Expected utility theory (EUT) is the most widely applied theory in the analysis of decision-making under risk, especially in the context of economic behavior. Based on a set of axioms which are assumed to be in line with *'rational behavior,'* the theory tries to characterize and furthermore, to predict the behavior of any individual who obeys the axioms. An individual's preference is described by using the notion of *utility*, in that "the utility of one choice is greater than the utility of another choice if and only if the former choice is preferred to the latter choice by the individual" (Hey 1979:33). The utility of a choice is evaluated by "finding the expected value of the utility of the outcome—that is, by weighing the utility of each basic outcome by the probability of its occurrence" (Hey 1979:33). In this study, *EUT*, especially its part of *multiattribute utility theory (MAUT)*, will be introduced to conceptualize the potential migrants' decision problem in terms of goal achievement. It is assumed that most people migrate in order to achieve certain goals in their lives. Therefore, their decisions on certain migration destinations may be concerned with making tradeoffs among possibly conflicting goals. A more detailed discussion will be given in Chapter 2 to illustrate how *MAUT* ensures that the decision made will maximize the achievement of their goals. However, as is generally recognized, *EUT* is a normative rather than a descriptive theory. It presents the principles and methods for making the best decisions under specified conditions, but it does not purport to describe how actual decisions are made in the real world (Svenson 1979; Hamburg 1983; Baron 1988). As a result, it will not be used as a major theoretical framework in the current study of migration decision-making behavior. Instead, the next two descriptive models of decision-making are chosen, since, as will be shown below, they fit better the purpose of this research.

(2) Model of search for a dominance structure.
Montgomery's psychological model of decision-making is adopted in the current study. The model views the decision-making process "as a search for a dominance structure, *i.e.*, a cognitive structure in which one alternative can be seen as dominant over the others" (Montgomery 1989:23). The search for a dominance structure is assumed to go through four phases, namely *pre-editing, finding a promising alternative, dominance testing,* and *dominance structuring* (Montgomery 1983;1989). The reason that the "search for a dominance structure" makes a better descriptive model of migration decision-making than utility theory is that the former recognizes people's "bounded rationality" in terms of their cognitive limits, lack of complete information, and being satisficers instead of optimizers. It accounts for people of different degrees of rationality/irrationality, distinguished by the various decision rules being adopted. Utility maximization is one of the rules that might be adopted in a decision-maker's search for a dominance struc-

ture. It symbolizes a high degree of rationality on the part of the decision-maker.

(3) Prospect theory.
This theory has been developed as an alternative choice theory to expected utility theory. It is observed that "choices among risky prospects exhibit several pervasive effects that are inconsistent with the basic tenets of utility theory" (Kahneman and Tversky 1979:263). As a result, Kahneman and Tversky modified two of its important concepts—utility of an outcome and probability of its occurrence—with more considerations of what people really do in reality. Instead of using utility as the measure of preference, prospect theory defines the individual's choice problem in terms of *prospect* that is characterized by its value and weight scales, and the decision-maker "is assumed to evaluate each of the edited prospects, and to choose the prospect of highest value" (Kahneman and Tversky 1979:275). Prospect theory is believed to be more appropriate as a descriptive model of decision-making under risk than expected utility theory. A framework of the theory will be adopted by the current study to describe the way migration decision-makers evaluate risky properties in alternative destinations. The applicability of the theory in migration decision-making will then be tested in the empirical survey of Chinese immigrants in Edmonton

(4) Decision rules.
The decision theory adopted by this research is mainly derived from the psychological literature, where numerous decision rules have been suggested to explain how people choose among multiattribute alternatives (Montgomery 1983; Svenson 1979). The decision rules referred to in the discussion of migration decisions of this study are listed in Table 1.1. All rules assume that a decision situation consists of a number of *choice alternatives* (*e.g.*, A_1 and A_2) which can be described in terms of subjectively defined dimensions or *attributes* (of which values are defined by $C_1, C_2, \ldots, C_i$). A detailed discussion of the decision rules in the context of migration will be presented in Chapter 2. They are the rules or strategies assumed to be used by potential migrants to process information during their search for a dominance structure. Different rules serve various local functions in different phases of the process. Again, their applicability in migration decision-making situations will be tested in the empirical survey of Chinese immigrants in Edmonton.

(5) Survey technique.
It is fundamentally believed in behavioral research that any theoretical model is subject to empirical test. A typical way to test the descriptive validity of a decision model is to see if it can explain past decisions. The present model was tested against a sample of Chinese immigrants in Edmonton, using survey techniques.

Table 1.1: Selected decision rules in choice

Name of rule	Abbreviation	Choice requirement
Non-compensatory Rules:		
Dominance rule	DOM	Choose alternative A_1 over A_2 if A_1 is better than A_2 on at least one attribute and not worse than A_2 on all other attributes.
Conjunctive rule	CON	Choose only alternatives which exceed or are equal to all of a set of criterion values C_i on the attributes.
Disjunctive rule	DIS	Choose only alternatives which exceed or are equal to at least one of a set of criterion values C_i on the attributes.
Lexicographic rule	LEX	Choose alternative A_1 over A_2 if it is better (or significantly better) than A_2 on the most important attribute. If this requirement is not fulfilled, base the choice on the most attractive aspects of the attributes next in order of importance, etc.
Elimination by aspects rule	EBA	Exclude all alternatives which do not exceed a criterion C_i on the most important attribute. Repeat this procedure with new attributes in order of importance.
Compensatory Rules:		
Maximizing number of attributes with a greater attractiveness rule	MNA	Choose A_1 over A_2 if A_1 differs favorably from A_2 on a greater number of attributes than the number of attributes on which A_2 differs favorably from A_1.
Addition of utilities rule	AU	Choose the alternative with the greatest sum of (weighted) attractiveness values (utilities) across all attributes.

Source: Montgomery 1983: 345

The purpose of the survey was to collect information from individual respondents to verify whether the model, which was converted into a series of testable hypotheses, has reflected migration decision processes in the real world. Since the test of most of the hypotheses requires retrospective questions, *i.e.*, questions tracing how the decision on migrating to Canada had been made, memory lapse is a possible problem concerning the quality of this survey. In this regard, the survey population was restricted to the most recent immigrants, *i.e.*, those who emigrated into Canada between 1985 and 1990. Various statistical methods were used to ensure that only those returned questionnaires that have consistent answers were included in the data analyses. The reason for choosing Chinese immigrants as the subject of study was that a sampling frame is relatively easy to construct. Chinese surnames are identifiable from telephone directories, which may offer information on where to locate the sample. The author could also take advantage of her knowledge of Chinese to communicate with those immigrants who have difficulty in speaking, reading or writing English.

There are basically two types of survey design that were used in the present research:

1. Telephone interview. The only practicable way to obtain a list of the survey population was to use the Edmonton telephone directory. About 6,000 Chinese last names have been identified from the 1991 *White Pages* of the Edmonton telephone directory. A sample was drawn from those names, and phone calls were made to them to identify those who were of Chinese origin, who came to Canada between 1985 and 1990, and who agreed to fill out a questionnaire that would be mailed to them.

2. Mail questionnaire. After obtaining a list of qualified respondents, a questionnaire was mailed to each of them with a self-addressed business reply envelope. The survey was conducted on a confidential and anonymous basis.

(6) Statistical technique.

Statistical techniques were used in data analysis. They were also used to check the quality of returned questionnaires. Most of the tests were for contingency tables—to determine whether the two or more categorical variables were independent, as shown by the frequencies in the table. Non-parametric statistical tests, such as *chi*-square one-sample test, *chi*-square test for k independent samples and Spearman rank order correlation coefficient were repeatedly used in this study since most of the data were at either the nominal or the ordinal levels of measurement. Some descriptive statistical methods, such as the Pearson correlation coefficient were also used to identify the degree of linear relationship between two variables.

1.4. Overview of the thesis

This dissertation consists of nine chapters. Chapter 1 outlines the rationale for the study, the objectives expected to be achieved by the study, and the main theories and techniques adopted by the study. Chapter 2 presents several types of decision problems and the strategies widely used to deal with those types of decisions. The purpose of the chapter is to demonstrate how the problem of migration decision-making process is formulated, why some decision theories and strategies are more appropriate than others and thus adopted by this study to deal with migration decision-making problems. Chapter 3 reviews the current literature on migration decision-making. Shortcomings existing in the literature are identified in order to demonstrate the necessity and importance of the current research. Chapter 4 offers some background information regarding recent Chinese emigration to Canada. The high proportion of Chinese in the overall inflow of immigrants since the mid-1980s and the attention drawn to this by the Canadian public, make it quite clear that Chinese play an important role in the "new wave" immigration of Canada (Simmons 1990). This justifies the choice of Chinese immigrants as the subject of this study. Chapter 5 is concerned with the technical aspects of the research. It explains the design of the survey as well as the questionnaire, introduces the methods of controlling the quality of returned questionnaires, and finally presents findings of the demographic background of the survey sample. Chapter 6, as a prelude to the core of the research that centers on the process of making a relocation decision, addresses certain issues regarding the decision to migrate, the one that leads to the relocation decision. It reveals the stresses, motivations and constraints of immigration based on the survey of Chinese immigrants in Edmonton. Chapter 7 and 8 are the core of this study where a model of individual migration decision-making process is presented, and the issue of risk associated with the decision is addressed. Statistical verification of hypotheses are conducted also in these two chapters. The model accounts for different ways in which potential migrants perceive and evaluate alternative destinations under the condition of risk, and finally choose one as their migration destination based on certain decision rules. Issues concerning information search behavior are discussed in Chapter 7, along with the progress of the decision-making process.

The last chapter, which is the conclusion of the dissertation, summarizes the entire dissertation research by pointing out what has been achieved by the study, what are the shortcomings concerning the study design and what further studies could be conducted in the future in order to improve our understandings of individual migration decision-making.

Chapter 2

Decision theories and their relevance to migration

The ultimate objective of scientific research on decision-making, as is pointed out by Wendt and Vlek (1975), is two-fold: (a) to develop a theoretically sound technology for the optimal solution of decision problems, and (b) to formulate a descriptive theory of human decision-making. Two camps of decision researchers, namely mathematicians and economists, and psychologists have been associated with these two research orientations, respectively. It is often stated that the roots of decision theory are to be found in mathematics and economics, which have contributed central concepts of classical normative decision theory such as probability, utility, and heuristics (Scholz 1983). During the last thirty years, however, the scope of the theory of decisions has been expanded by several psychological approaches in human decision behavior research. Psychological researchers believe that models prescribing how people should make decisions need to incorporate knowledge about the ways people actually do make decisions. As a result of the parallel development in the two camps, the current literature of human decision-making is rich in both normative and descriptive theory generalizations. Likewise, most research that has been done can be classified into the two camps one way or the other.

By presenting different types of decision with alternative procedures or strategies, this chapter will show why the various decision theories can or cannot be applied to migration decision-making problems. The basic argument is that descriptive theories are a better tool than normative theory in understanding the behavior of migrants. It also justifies the choice of the model of search for a dominance structure and prospect theory in this particular study.

The first stage in analyzing any decision problem is the formulation of a pre-

cisely defined decision structure. Following is a set of concepts (elements) that defines the decision problems dealt with in this study:

1. **Decision-maker.** The agent charged with the responsibility for making the decision. A migration decision-maker is viewed as a single individual, who has the freedom of making choices between move and stay, and among alternative migration destinations. With regard to the question of the influence other family members may also have on the individual's decision, it is assumed, as has been done in some other studies (*e.g.,* Simmons 1986) that their values have been internalized by the individual. For example, one thinks of job opportunities and access to education for oneself as well as for one's spouse and children.

2. **Options or alternative courses of action.** The decision involves a selection among two or more alternative migration destinations, referred to simply as *alternatives* (*e.g.,* countries). Empirical evidence (*e.g.,* Cannon 1989) suggests that recent Hong Kong immigrants in Canada did consider a number of alternative countries before they made their decisions to come to Canada.

3. **Possible outcomes.** Possible outcomes are viewed as lying outside the control of migration decision-makers, who have perceptions of and a vocabulary for reporting on the advantages and disadvantages of alternative destinations, even though they do not know for certain which outcome will occur with regard to each particular destination. The possible outcomes of a migration decision problem are also referred to as place-related *attributes* or *properties* (*e.g.,* income or housing).

4. **Values or motivations.** These are personally valued goals that might be met by moving. Migration decision-making is assumed to be a motivated behavior, which is "variable, constructive, and goal-directed" (Vroom 1964:9). The multiple values (goals) of migration defined in this study are based on those specified in De Jong and Fawcett's (1981) value-expectancy model, adjusted to existing empirical findings of recent Chinese immigrants to Canada.

5. **Constraints.** A key factor in understanding the migration decision process is the specification of constraints (Fawcett 1986). External constraints reduce the option space, *i.e.,* the possible migration destinations. Especially in the case of international migration, immigration policies of receiving countries, for example, are an obvious constraint to potential immigrants in choosing their migration destinations.

6. **Uncertainty or risk.** There is always an indefiniteness concerning the possible outcome. There are two different ways in which uncertainty may arise regarding the decision to migrate and the relocation decision:

   - Internal uncertainty—springing from the potential migrant's inner experience: uncertainty about success or failure of the forthcoming move, uncertainty about the future. This uncertainty, as is pointed out by G. Haberkorn (1981), is one important variable that determines whether certain objective criteria would initiate a migration decision-making process. In other words, it determines whether the decision to seek a new residential site will be reached. This kind of uncertainty is usually avoided or reduced by imitating the successful behavior of pioneering migrants.
   - External uncertainty—deriving from socioeconomic circumstances or natural hazards of potential destinations: uncertainty (or risk) that stems from sources outside the migration decision-maker. In the case of risk, the lack of certainty is indicated in terms of subjective probabilities assigned to outcomes. Most relocation decisions, or decisions concerning choosing one destination out of several alternatives are made under the condition of risk. This kind of uncertainty and risk may be solved or reduced through information search.

Decision-making is a frequent and important human activity (Hayes 1989). Depending on the nature of the problem, decisions are generally classified into four types with which different decision procedures and rules are associated: (1) Decisions under certainty, (2) Decisions under risk, (3) Decisions under uncertainty and (4) Decisions under conflict. Decision under certainty is a situation when decision-makers face several alternatives, with properties associated with each of the alternatives known to them. Their task is to choose one alternative that is most preferable. Decision under risk and decision under uncertainty bear one common feature that is "lack of certainty"—individuals whose behavior is being examined do not know with certainty the consequences of their actions. In other words, the outcome of any choice the individual makes depends not only on what the choice is, but also on what the 'state of the world' happens to be. Two forms of 'lack of certainty' have been distinguished (Hey 1979): the first, where the individual feels able to attach probabilities to the various possible 'states of the world'; the second, where the individual feels unable to do so. Like many other studies, this study differentiates between these two forms by referring to the first as *risk* and to the second as *uncertainty*. Furthermore, it is assumed that potential migrants perceive the lack of certainty as a situation of risk. In other words, potential migrants can list the possible outcomes that they perceive may occur and can attach subjective probabilities to these outcomes. Decision under

conflict involves two competing parties, such as in chess, poker, business or war. The theory dealing with such decisions is also called *"Game Theory"* (Wonnacott 1970). Apparently, a migration decision-maker is not usually caught in a situation where a hostile opponent exists who will do his/her best to counter whatever the migrant decided to do. Therefore, decision under conflict will not be included in this discussion, except that the strategy associated with it will be indicated in Figure 2.1. Hayes (1989) summarizes the above four types of decision situations and decision procedures associated with each of them into a decision tree, that is similar to the one shown in Figure 2.1. Figure 2.1 differs from Hayes' decision tree only in the decision procedures involved. As Hayes pointed out, by answering the questions and walking through the decision tree, one may find the decision procedure that is appropriate to a specific situation.

Although a decision tree like Figure 2.1 does not include all the applicable and well-cited decision procedures, it provides a useful clue to a review of decision methods or rules under different decision situations. Instead of aiming at presenting the breadth and variety of theoretical approaches to decision-making, the remaining part of the chapter will selectively evaluate some of the decision procedures that are shown in Figure 2.1, and more importantly, their relevance to migration decision-making.

2.1. Decision under certainty

In order to show how decision-making theories can be applied to migration decision problems, the following discussion on decision under certainty will be exemplified by working through each of the decision procedures with a migration decision-maker. In presenting the decision problem in a structure discussed earlier in this chapter, it is assumed that the decision-maker faces a number of alternative migration destinations (A, B, C) from which a choice has to be made. The decision-maker also has full information about the properties of the alternatives that must be considered in making the decision. Suppose the properties include size of city, job opportunity, annual income, quality of school, and weather. The properties and their corresponding values are presented in Table 2.1. The following eight decision rules explain how most people would make decisions under certainty.

Dominance rule (DOM) The dominance relation means that one alternative dominates another if both of the following conditions are satisfied:

1. It is at least as good as the other on all properties, and
2. It is better on at least one property.

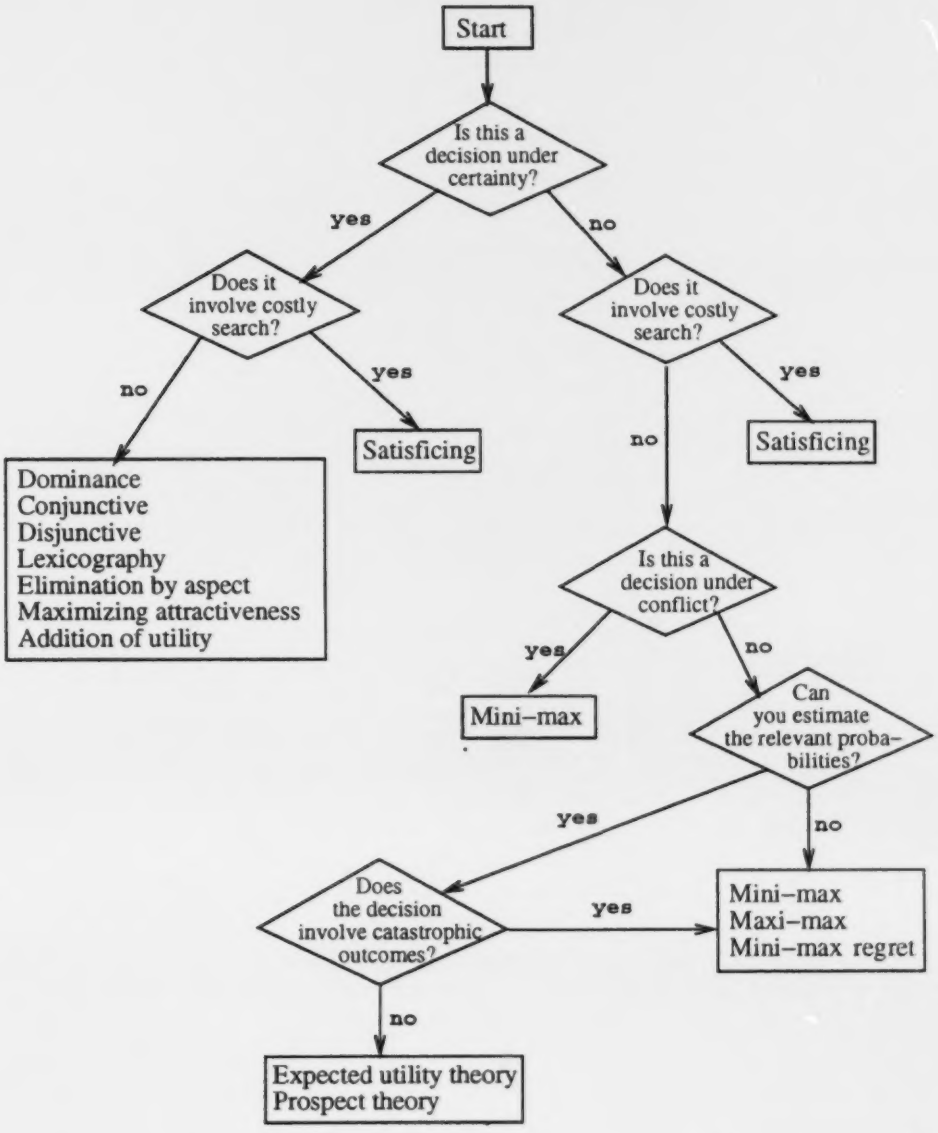

Figure 2.1: A decision tree for choosing a decision procedure (Source: after Hayes 1989:252)

Table 2.1: Alternative cities

Properties	City A	City B	City C
Size of city	Overcrowded	Comfortable	Comfortable
Job opportunity	One job	One job	One job
Annual income	$50,000	$50,000	$50,000
Quality of school	Good	Bad	Excellent
Weather	Cold	Extremely cold	Warm

Any alternative that is dominated by another is dropped from consideration. Any alternative that dominates all the others is chosen as best. In the example, city C is as good as city B in "size of city," "job opportunity," "income," and it is better in "quality of school" and "weather." City C is also as good as city A in "job opportunity," "income," and it is better in "size of city," "quality of school" and "weather." City C dominates city A and B and therefore should be chosen over city A and B.

Dominance is not a very powerful decision-making method because it usually does not eliminate very many of the alternatives. The advantage of the method is that people can agree upon which alternatives are dominant, even though they may differ about what properties are most important for making the decision (Hayes 1989). In the case of one decision-maker, even if he changes his mind about how important the various properties are, the dominance relations will remain unchanged. The dominance rule can be used to confirm that the chosen alternative does not have any disadvantages relative to other alternatives in a migration decision-making process.

Conjunctive rule (CON) The conjunctive rule requires the decision-maker to specify a set of criteria values on the properties which a chosen alternative must be equal to or exceed. If an alternative does not meet the criterion on just one property, the alternative is dropped from the list of remaining possible alternatives. This elimination of the alternatives proceeds, if possible, until only one alternative remains. Assume in the example, the criteria values for the above properties by a potential migrant are: comfortable size, one job offer at an annual income no less than $50,000, good school, and a warm temperature. City A fails to meet the criteria on size of city and weather. City B could neither meet the criterion on quality of school, nor on weather. Only city C meets all the criteria values on all the properties. Therefore, city A and B are dropped while city C is chosen. Like the dominance rule, the conjunctive rule does not always lead to a decision either since there may be multiple alternatives that meet all the criteria. The conjunctive rule is useful when used to screen out some alternatives

for consideration before other decision methods are applied.

Disjunctive rule (DIS) The disjunctive decision rule also requires a set of criteria values on the properties. A chosen alternative must have at least one property greater than the corresponding criterion, and all the properties of the other alternatives should fall below or be equal to the criteria values. The disjunctive rule can be used to single out alternatives that seem promising during a migration decision-making process. In the example, suppose the set of criteria values are: comfortable size, one job offer, $60,000 annual income, good school, and not extremely cold weather. Both city A and C can be chosen according to the disjunctive rule.

Lexicographic rule (LEX) The lexicographic method is so-named because of its resemblance to the procedure for ordering words in the dictionary. To make a decision by this method, one considers the most important property first. If one alternative is better than the other alternatives on the most important property, then that alternative is the one chosen. If two or more alternatives are tied on the most important property, then drop the other alternatives from consideration and consider the second most important property in order to break ties. If any ties remain unbroken, then consider the third most important property, and so on. With the lexicographic method, the decision-maker must specify the order of importance of the properties of the alternatives. For example, the order of importance of properties specified by a potential migrant is job opportunity, size of city, weather, quality of school, and income. City A, B and C are tied on "job opportunity" so the decision-maker has to move on to the second most important property—size of city, on which city B and C are tied and city A has a disadvantage in it. Therefore city A is dropped from further consideration and the decision-maker goes on to compare city B and C on the third most important property—quality of school—and chooses city C.

The lexicographic rule is useful in finding a promising alternative or confirming that a chosen alternative is the best among all possible alternatives during a migration decision-making process. It is quick and easy to apply. However, it is only appropriate when one of the properties outweighs all of the others in importance. If all properties are roughly equal in importance, the chances are that the rule will lead a decision-maker to a place that has a slight advantage in the most important property, even though that advantage is outweighed by big disadvantages in other properties (Hayes 1989).

Elimination by aspects rule (EBA) This rule may be interpreted as a combination of the lexicographic rule and the conjunctive rule. A decision-maker looks

for favorable properties, one property at a time, usually in the order of importance, across all of the choice alternatives. Whatever property is examined, all of the alternatives in the choice set that could not meet the criterion set on that property are eliminated. This procedure is repeated with new properties successively lower in the order of importance. In the example, a set of criterion "one job, $60,000 annual income, warm climate, good school and comfortable size" are given in the order of importance. All three cities passed the job criterion but failed to pass the income criterion. Therefore none of the three cities can be chosen by the elimination by aspects rule. The elimination by aspect rule can be used in the screening of potential destinations that have a chance to be chosen in a migration decision-making process.

Maximizing number of attributes with a greater attractiveness rule (MNA) This rule prescribes a choice of the alternative with the greater number of favorable properties. City B is better than city A in "size of city," and is worse in both "weather" and "quality of school." So city A is chosen over city B. City C is better than city A in "size of city," " quality of school" and "weather," while two cities tie on all the other properties. City C is also better than city B in "quality of school" and "weather," while two cities tie on all the other properties. As a result, city C is finally chosen according to the maximizing number of attributes with a greater attractiveness rule. The rule does not lead to a decision between two alternatives when the numbers of favorable properties for both alternatives are equal.

Addition of utilities rule (AU) Utility, as will be discussed in detail in the next section, is the measure of goal achievement. A potential migrant may want to achieve several goals by migration. However, the real world usually makes it difficult for people to achieve all their goals at once and at the same place. For example, city A offers a very well paying job but the cold and humid weather is not good for the migrant's health. City B is warmer and the job is not bad, either. But it lacks a good enough school and social environment in which his children can grow. Therefore, migrants need to make tradeoffs among different goals. The addition of utilities rule states that a decision is based on a summation of all utilities for each alternative. The one with the greatest total of utility will then be chosen.

Satisficing method The above decision methods are designed to find the best available alternative. They are called optimizing methods. There is another decision situation, which was first described by Simon (1955) as *satisficing*. The satisficing method is not designed to identify the best alternative. Rather it is designed to find the first satisfactory alternative, or "a course of action that is

good enough in view of the intended goal or current level of aspiration of the decision-maker" (Taylor 1984). Consider Table 2.1, suppose the worst values the potential migrant is willing to accept for each of the properties are: comfortable size of the city, one job offer at $40,000 annual income and not extremely bad school. Weather is not a concern. City A fails to meet the requirement for size of city. City B meets all of the minimal requirements and is therefore chosen. Notice city C is not considered in this case even though it also meets all of the minimal requirements. That is because the decision is already made after the first satisfactory alternative is found.

The satisficing method is particularly useful when people have to choose among a large number of alternatives, since human minds are subject to "limited capacity for comprehending all alternatives in a given decision" (Taylor 1984). Simon (1955) first raised the issue of "bounded rationality" to explain the behavior of decision-makers who satisfy, although most of them would prefer to maximize. The satisficing method is also useful when information search is tedious and costly. The idea of bounded rationality is generally accepted by theories of administrative decision-making, and the satisficing behavior has been found in many studies (Taylor 1984).

2.2. Decision under uncertainty

Decision under uncertainty is a situation when decision-makers do not know with certainty the consequences of their actions at the time the decision must be made. They must decide on a course of action to be pursued, knowing that the consequences associated with the selection of any given act will depend on future conditions (Parsons 1974; Hey 1979). Suppose the economies of the three potential destinations in the above example are affected by the world oil market. Therefore the salaries that can possibly be offered in various cities become an uncertain factor that depend on the changes of the world oil price. The decision situation of a potential migrant is now expressed in Table 2.2, assuming salary is the only factor affecting the migrant's decision. Other uncertain properties are evaluated in a similar way.

The concepts and relationships displayed in tables of this sort lie at the heart of most analyses of decisions that must be made under uncertainty. The outcome depends not only on which option people choose (move to city A, B or C) but also on which of various propositions—called "state of the world"—are true (Oil price increases or decreases). Three elements that define the decision structure are represented in the table: *states, options,* and *outcomes.* The *states* in the table are arranged so that they are mutually exclusive as well as exhaustive: Only one can be true and one of them must be true (The state "Oil price stays the same" is omitted

Table 2.2: Decision table for a potential migrant

Option	State of the world	
	Oil price increases	Oil price decreases
Move to city A	Salary increase by 10%	Salary decrease by 5%
Move to city B	Salary decrease by 3%	Salary increase by 7%
Move to city C	Salary decrease by 4%	Salary increase by 4%

from table 2.2, for it results in a situation of decision under certainty in this example, for which solutions were discussed in the previous section). *Options* are the possible courses of action people are considering. In the table, they correspond to the row headings ("Move to city A" *etc.*). They must all be feasible. The entries in the middle portion of the table are the *outcomes*. Outcomes are simply the descriptions of whatever would occur if an option is taken and a certain state comes about. The numerical values of the various outcomes are presented in Table 2.3, which is also called a table of payoff in decision analysis. The following three decision strategies are the most frequently used in decisions under uncertainty.

Table 2.3: Values of acts for a potential migrant

Act	State of the world		Row Minima	Row Maxima
	Oil price increases	Oil price decreases		
Move to city A	+ 10	- 5	-5	10
Move to city B	- 3	+ 7	-3	7
Move to city C	- 4	+ 4	-4	4

Mini-max strategy This strategy is a very conservative, pessimistic strategy which assumes that whatever action people choose, nature is against them and will cause the worst possible outcome. Thus, if a decision-maker decides to move to city A, the strategy makes the gloomy assumption that the world oil price will decrease. On the other hand, if he/she decides to move to city B, then the strategy assumes that the world oil price will increase. The values of these worst outcomes, the row minima, are shown in the fourth column of Table 2.3.

The mini-max strategy calls for choosing the action that gives the best (largest) of these minima. That is, it chooses the action whose worst possible outcome is not as bad as the worst possible outcomes of other actions. Thus, since the worst possible outcome for moving to city A is -5 and the worst possible outcome for moving to city B is -3, the mini-max strategy chooses moving to city B (City C is eliminated because it is dominated by city B.).

The mini-max strategy has the nice property that it guarantees an outcome which is no worse than the minimum value for the action. The outcome may be better than that minimum, but it will certainly be no worse. However, the strategy may eliminate the best outcome from consideration.

Maxi-max strategy This is an optimistic strategy which assumes that nature will cooperate with us to provide the best possible outcome for the action we choose. The values of these best possible outcomes, the row maxima, are shown in the right-hand column of Table 2.3. The maxi-max strategy chooses the action which yields the best of the best possible outcomes. In this case, it chooses city A. This strategy has the nice property of guaranteeing the decision-maker a chance to obtain the best possible outcome. However, it does not offer any protection to people against the possibility that they may end up with the worst possible outcome, as the mini-max strategy does.

Minimizing maximum regret This rule concentrates on the regret experienced by the decision-maker on learning the actual state of the world. Suppose a decision-maker has decided to move to city A and then the world oil price has decreased and so has her salary. She must regret not having moved to city B. As a measure of regret, the rule takes the difference between the value of the outcome the decision-maker actually obtained and the maximum value that could be obtained had a different alternative been chosen. A regret matrix can be formed for the migration decision-maker by computing regret for each possible outcome, as shown in Table 2.4. For example, if the world oil price turns out to increase and a migrant choses to move to city A, his regret is 0. However, if the oil price decreases and he choses city A, his regret is 12, the difference between what he could have received, 7, and what he actually got, -5. If the migrant is to minimize regret in this case, he must choose city A.

Table 2.4: Payoff and regret matrices for a potential migrant

Act	Payoff matrix		Regret matrix	
	Oil price increases	Oil price decreases	Oil price increases	Oil price decreases
Move to city A	+ 10	- 5	0	12
Move to city B	- 3	+ 7	13	0

Although it is possible that a migration decision-maker perceives himself in a situation of uncertainty, it is not likely that most people would like to do so, especially when international migration is considered, which is a big and serious decision for most of them. In that case, migration decision-makers will tend

to be cautious in making their choices and they will try to collect information about the potential migration destinations to reduce as much as possible the degree of uncertainty. As a result of increased information, the migrants will move themselves from decision under uncertainty into either decision under certainty, or decision under risk. The latter type of decision will be discussed in the next section.

2.3. Decision under risk

In decision under risk, an individual is also confronted with sets of alternative choices, each of which attached to a set of basic outcomes. Which basic outcome will occur is not known in advance. The decision-maker, however, can attach probabilities (either objective or subjective) to the various possible basic outcomes of each alternative choices. Two theories that deal with decisions under risk are discussed below: a normative and a descriptive theory.

2.3.1. Expected utility theory

Expected utility theory is the most widely applied normative theory of decision-making that concerns how people should choose among possible actions under the condition of risk. The best decision, according to Baron(1988), is the one that helps us best to achieve our goals and therefore utility is perceived as the measure of goal achievement. *Utility theory* is a theory of how we should measure and maximize utility so as to reach the best decision.

The concept of utility respects the variety of human goals. It represents whatever people want to achieve (Baron 1988). "Making more money" may be a goal of migration, and so are "suitable weather," and "good education for children." The migration decision-maker's utility of a possible choice depends on (1) to what extent do each of the outcomes associated with the choice help him achieve his goal of migration, and (2) how likely will the outcomes occur in different states of the world. Again, assuming "making more money" is the only goal of migration for a potential migrant, Table 2.2 is thus used to explain how to assign values to utilities of the various outcomes (For simplicity's sake, only city A and B are considered). Utility is measured on a nominal scale, whereby zero utility can be assigned to any one of the outcomes and then becomes the reference point. As well, the units of utility are chosen arbitrarily. For example, the decision-maker assigns 0 to "Salary increase by 3%" and the unit of utility is set at 1%. Therefore, "Salary increase by 7%" is +4 and "Salary increase by 10%" is +7. Meanwhile, "Salary decrease by 3%" is -6 and "Salary decrease by 5%" is -8.

In order to find the best option, the decision-maker computes the utility of each option by multiplying the utility of the outcome by the probability of the state that leads to it, and then adds across the states. The option with the highest utility is one that should be chosen. The mathematical formula for calculating expected utility is as follows:

$$EU = \sum_i p(i)u(i) \tag{2.1}$$

where EU stands for *expected utility*;

$u(i)$ stands for the utility of the *ith* outcome;

$p(i)$ stands for the probability of the *ith* outcome.

In the example, assuming there is a 60% probability that the world oil price will increase and a 40% probability that the price will decrease. The utilities assigned to each of the outcomes are as stated above. The expected utility of moving to city A and B will be:

$$EU_A = .6u(10) + .4u(-5) = .6(7) + .4(-8) = .42 - .32 = .10 \tag{2.2}$$

$$EU_B = .6u(-3) + .4u(7) = .6(-6) + .4(4) = -.36 + .16 = -.20 \tag{2.3}$$

According to expected utility theory, the decision-maker should choose to move to city A.

Migration decision-making usually involves a selection among two or more alternative migration destinations, each of which has a set of goals to be achieved by the migrants. Therefore, *multiattribute utility theory (MAUT)*, a part of utility theory that is particularly concerned with making tradeoffs among different goals, fits the migration situation even better. How should a potential migrant make her decision if city A offers a very well paid job but the cold and humid weather is not good for her health? What if city B is warmer and the job is acceptable, but the community lacks a good enough social and educational environment in which her children could grow? According to MAUT (Baron 1988; Von Winterfeldt and Fischer 1975), the overall utility of an option depends on the utility of each of its goals and the importance of each goal relative to one another. In order to maximize the utility of a place, decision-makers have to first decompose the task into the evaluation of each property or dimension of the place. The factors that frequently enter into people's evaluation of a place are such as job opportunity, living cost, local scenery, climate, cultural and linguistic variety, political attitude, and educational system, to name but a few. They will then consider the importances of different properties to their overall evaluation of that place by assigning

a relative weight of importance to each property. After that, the decision-makers will add up the weighted single dimension utility across all the properties of a place to get an overall utility of that place. When all potential destinations are evaluated in that way, the finally chosen destination should be the one with the highest overall place utility. The additive expected utility representation is given the following form by Von Winterfeldt and Fischer (1975):

$$U(X_1, X_2, ..., X_j, ..., X_m) = \sum_{j=1}^{m} p_j \sum_{i=1}^{n} u_i(x_{ij}) \tag{2.4}$$

where $X = (X_1, X_2, ..., X_j, ..., X_m)$ is a risky alternative for which the multiattributed outcome X_j is received if event E_j occurs;

p_j is the probability of this event;

x_{ij} is the state of the ith attribute of outcome X_j;

u_i is the utility function over the ith attribute; and

U is the expected utility for the risky alternative X.

And the decision-makers' preference is expressed by:

Events

$$\mathbf{X} = \frac{E_1 E_2 E_3 \ldots E_j \ldots E_m}{(x_1, x_2, x_3, \ldots, x_j, \ldots, x_m)} \succeq \frac{E_1 E_2 E_3 \ldots E_j \ldots E_m}{(y_1, y_2, y_3, \ldots, y_j, \ldots, y_m)} = \mathbf{Y} \quad \text{iff}$$

$$U(\mathbf{X}) = \textstyle\sum_{j=1}^{m} p_j U(x_j) \geq \sum_{j=1}^{m} p_j U(y_j) = U(\mathbf{Y})$$

Here $\mathbf{X} \succeq \mathbf{Y}$ means "$\mathbf{Y}$ is not preferred to $\mathbf{X}$".

The application of MAUT could ensure that a decision-maker evaluate complex, multiattributed places consistently, and that the decision made will maximize the achievement of all goals of migration. The proper use of MAUT requires that the dimensions or properties of a place that a decision-maker views are indeed independent. As was pointed out by Baron (1988), if the dimensions in the particular decision did not seem to be psychologically independent from the outset, MAUT, in its basic form, had no normative status and should not be attempted. For example, suppose a decision-maker were using MAUT to decide which neighborhood to move into, and the three dimensions were cost of housing, accessibility

to indoor recreational facilities and natural scenery. He could use a MAUT analysis if he regarded these three dimensions as independent. He might, however, think that good accessibility to indoor recreational facilities makes close to beautiful natural scenery less important, for his family can always enjoy the indoor pool and tennis court even if they do not have a superb view looking out from their kitchen window. Therefore, the decision-maker would be unwilling to pay extra money for a house near beautiful natural scenery than if there were not a good accessibility to indoor facilities. In this case, the accessibility to indoor facilities would affect the tradeoff between housing price and natural scenery of location: If he tried to use natural scenery of neighborhood location to measure the utility units for housing price, he would get different results for different accessibilities to indoor recreational facilities.

Expected utility theory is implied by certain principles, or "axioms," that create an internal consistency among the choices people would make at a given time. For instance, the *transitive* principle states if a person prefers X to Y and Y to Z, then he must prefer X to Z. Also the principle of *substitution* asserts that if B is preferred to A, then any probability mixture (B, p) must be preferred to the mixture (A, p). The next section, based on psychological research, will show that people violate these principles systematically when they make decisions. At the same time, however, their violations are explained by a more descriptively sound theory—the prospect theory.

2.3.2. Prospect theory

In 1953, economist Maurice Allais first argued that expected utility theory failed as a descriptive model of decision-making (Baron 1988). Since then more critics of expected utility theory have emerged, especially from among psychologists. The examples of choice preferences shown in Table 2.5 are selected from Kahneman and Tversky's experiments, who later developed *prospect theory* as a better descriptive model than expected utility theory (Kahneman and Tversky 1979).

Problem 1 represents a choice between option A—getting \$4,000 with a probability of .80 (and nothing with a probability of .20) and option B—getting \$3,000 with certainty. Problem 2, 3, and 4 are understood in a similar way with different probabilities and amounts. In their experiments, Kahneman and Tversky found out that most people preferred option B over option A in problem 1, and preferred option C over option D in problem 2. As a result, it reveals a contradiction in people's preference between these two choice problems. To show that, let $u(0) = 0$, and the choice preference in problem 1 implies $u(3,000) > .80u(4,000)$ while the choice preference in problem 2 implies $.20u(4,000) > .25u(3,000)$. Now if a probability of .25 is assigned to problem 1, according to the principle of substitution,

Table 2.5: Kahneman & Tversky's experiments

Problem 1		
option A:	4,000,	.80
option B:	3,000,	1.00
Problem 2		
option C:	4,000,	.20
option D:	3,000,	.25
Problem 3		
option A:	6,000,	.45
option B:	3,000,	.90
Problem 4		
option C:	6,000,	.001
option D:	3,000,	.002

(Source: Kahneman and Tversky 1979:266-67)

we should get $.25u(3,000) > .20u(4,000)$, which is the reverse inequality of what was revealed from problem 2. Again, in problem 3, most people preferred option B over option A while in problem 4 they preferred option C over option D. This also shows that the principle of substitution is violated. Other examples showing violations of expected utility theory are discussed by Baron (1988).

In order to explain why people's choices deviate from the normative model of expected utility theory, psychologists Kahneman and Tversky proposed *Prospect Theory*, a "more general descriptive theory ... that accounted for almost all of the available data concerning decisions under risk" (Baron 1988:329-30). In essence, prospect theory retained the basic idea of expected utility theory but modified its two important notions—probability and utility—to make it account for the observed behaviors.

The weight function

To modify the part of probability (p) in utility theory, prospect theory begins with the premise that people do not treat the probabilities as they are stated; instead, they distort them, according to what is called a weight function ($\pi(p)$). It is the decision weight, not probability, that directly affects a decision-maker's desirability of a certain outcome. The relationship between $\pi(p)$ and p is as shown in Figure 2.2: $\pi(p)$ is generally underweighed with regard to the true value p, except for $p = 1.00$, or when p is very small. This is "[b]ecause people are limited in their ability to comprehend and evaluate extreme probabilities, highly unlikely events are either ignored or overweighed, and the difference between high probability and certainty is either neglected or exaggerated" (Kahneman and Tversky 1979:283).

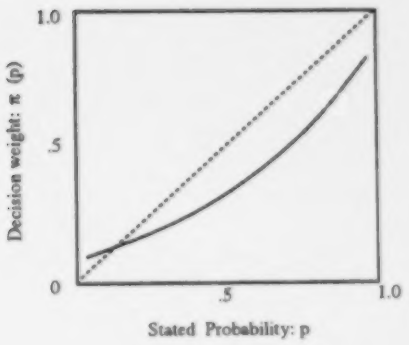

Figure 2.2: The weight, π, as a function of the probability of the outcome (Source: Kahneman and Tversky 1979)

Although prospect theory does not offer much insight into the psychological process pertaining to people's reaction to probability, it does exhibit several pervasive effects that function when people make choices among risky attributes. The following three effects summarize the nature of the π function.

- Certainty effect—people overweigh outcomes that are certain relative to outcomes which are merely probable.
- When probabilities of gaining are substantial, most people choose the prospect where gaining is more probable.
- When gaining is possible but not probable, most people choose the prospect that offers the larger gain.

Certainty effect is the reason why most people preferred option B over option A in problem 1 of Table 2.5. Because of the fact that $\pi(1.00)$ was much higher than it ought to be relative to $\pi(p)$ for other values of p (except for very low values, which were not used in this problem), the certainty was overweighed. In problem 3 where the probabilities of gaining were substantial (.90 and .45), most people preferred option B even though the amount of gaining was much higher in option A because they overweighed the 90% probability. In problem 4 where both probabilities of gaining were minuscule (.002 and .001), people preferred option C which had a higher gain. The above properties of the π function illustrate common attitudes toward risk in that people tend to avoid risk if they can in choices involving sure gains.

The value function

The other modification prospect theory made to utility theory is concerned with utility. Instead of using the notion of utility, prospect theory proposes that people make decisions as if they had a value function for gains and losses, with the curve depicted in Figure 2.3. The horizontal axis is the monetary gain or loss compared with one's reference point, rather than an absolute magnitude. The vertical axis is essentially utility, but the letter $v(.)$ for value is used to indicate the difference between the prospect theory and standard utility theory (Baron 1988). As is

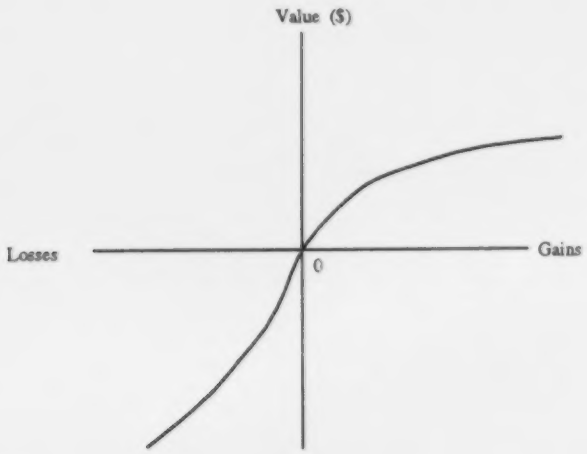

Figure 2.3: The value, v, as a function of the amount of gain or loss (Source: Kahneman and Tversky 1979)

shown in Figure 2.3, the value function is concave for losses (increasing slope as we move to the right, as shown in the lower left of the figure) and convex for gains (decreasing slope, as shown in the upper right). This is because "the psychological response is a concave function of the magnitude of physical change, ...the marginal value of both gains and losses generally decreases with their magnitude" (Kahneman and Tversky 1979:278). This means that people avoid risks in the domain of gains and seek risks in the domain of losses. Besides, people generally treat losses as more serious than equivalent gains, so the value function for losses is steeper than the value function for gains.

The differently curved value functions for gains and losses reflect another effect on human decision-making:

- Reflection effect—risk aversion in the positive domain is accompanied by risk seeking in the negative domain.

The examples in Table 2.5 indicated preferences between positive prospects, *i.e.*,

prospects that involve no losses. However, when the signs of the outcomes are reversed so that gains are replaced by losses, the preferences change as well. For example, when the signs of 4,000 and 3,000 in Problem 1 of Table 2.5 were reversed, 92% of the respondents chose to accept a risk of .80 to lose 4,000 in option A, in preference to a sure loss of 3,000 in option B (Kahneman and Tversky 1979:268).

Prospect theory modified expected utility theory by proposing that people distort probabilities and that their utilities are dependent on a reference point. It has been recognized as a good descriptive theory accounting for many empirical data concerning decision under risk (Baron 1988). This study will use it to describe migration decision-making behavior under risk. The four effects illustrated by the theory will later be formulated into testable hypotheses in the context of migration, and then be tested in the survey of Chinese immigrants.

2.4. Decision-making process

In view of the drawbacks associated with applying those non-compensatory and compensatory decision rules individually, and the descriptive inadequacy of utility theories, Montgomery (1983) proposed a model that emphasizes the perceptual, cognitive and dynamic process of human decision-making. In this model, human decision-making was viewed as a part of a larger psychological process, where it is related to action, structure of human memory and capacity limitations of human information processing. More precisely, the decision-making process is seen as a search for a dominance structure, *i.e.,* a cognitive structure in which one alternative can be seen as dominant over the others (Montgomery 1989). The author argued that the problems associated with applying various individual non-compensatory and compensatory decision rules could be avoided by integrating them into one multi-phases decision-making process and seeing them as operations in search for a dominance structure.

Based on the idea that human decision-makers act within "bounded rationalities," the authors argued that "a decision process consists of a series of structuring and restructuring activities" whereby a representation of the decision situation is arrived "in which one alternative can be justified for oneself and others as being the best choice" (Montgomery and Svenson 1989:136). The choice of a decision alternative is usually preceded by a hypothesis that this alternative is the best one, and the finally chosen alternative usually receives more attention and can be more positively evaluated than other alternatives long before it is definitely chosen. The search for a dominance structure is also assumed to go through the following four phases: (1) pre-editing—occurs in the beginning of a decision process, when the decision-maker selects those alternatives and attributes that should be included in his/her representation of the decision problem, (2) finding a promis-

ing alternative—aims at finding an alternative that has a reasonable chance to be seen as dominant over the others, (3) dominance-testing—the decision-maker tests whether a promising alternative has any disadvantages as compared with other alternatives, and (4) dominance-structuring—when the decision-maker finds that a promising alternative violates a dominance structure he/she will continue to this phase, to restructure the given information in such a way that a dominance structure is obtained.

Montgomery's theory has gained significant support in psychological studies of human decision-making since it was published. It will be used to build a migration decision-making model later in this study. Before doing that, a brief review of other studies, both theoretical and experimental, that have been found to support Montgomery's model will be presented. It is reasonable to assume that, as long as the natures of the decision tasks are similar, if dominance search exists in other kinds of human decision-making processes, so might it exist in migration decision-making.

2.4.1. Theoretical support from Image Theory

A more recent descriptive theory of human decision-making, namely *Image Theory* was proposed by Beach and Mitchell (1987a) in 1987. According to image theory, decision-makers represent information as images, including image of principles, image of goals, image of plans, and image of tactics. A decision-making process is seen as decomposed into a number of local decisions, *i.e.,* decisions about goals, principles, or plans (adoption decisions) and decisions about whether progress is made or not (progress decisions). Two evaluative criteria for adoption and progress decisions are identified. Normally decisions are based on the *compatibility* between candidates and constituents of the decision-maker's images. A candidate is adopted if the number of violations of the relevant image constituents is below a certain critical value (the rejection threshold). Otherwise it is rejected. If more than one candidate survives the compatibility test, then the choice between the survivors is made in terms of their *profitability,* which is the degree to which a candidate offers attractive consequences in terms of the goal, plan, tactic, and assumed to be conceptually similar to *expected utility* and hence corresponds to a compensatory decision rule. Although the theory of dominance search and image theory differ in the way a decision problem is framed and decision-making principles on which decisions are normally based, the authors of both theories agree that the two theories have similar ideas about how a decision process develops through time. In both theories it is possible to identify four phases of a decision process, *viz,* (1) rejection of non-acceptable or uninteresting alternatives, (2) identification of a candidate for the final choice, (3) tests whether such a candi-

date could be chosen definitely, and (4) restructuring operations when these tests give a negative result (Montgomery 1987). Both theories also identify dominance as the ubiquitous decision criterion (Beach and Mitchell 1987b). Therefore, the decision model of search for a dominance structure has received theoretical support from another separately developed theory for at least two of its major points, *i.e.,* a multi-phases decision process and the existence of a dominance structure.

2.4.2. Experiments that show the search for a dominance structure

That the decision-making process involves a search for a dominance structure has also been supported by a number of process-tracing experiments (Klayman 1983; Dahlstrand and Montgomery 1984; Bronner and De Hoog 1984; Sundstroem 1987; Tyszka 1989). Some experiments were directly designed to trace people's evaluation of alternatives as their decision-making processes develop through time, such as Dahlstrand and Montgomery's (1984) computer based study of subjects who chose among five flats in Göteborg. Some other experiments, however, focused on the patterns of information acquisition in the decision-making process, which revealed indirectly how local decisions were involved in the search for a dominance structure. Moreover, they indicated the existence of a tendency of partiality and selectivity of information searching and biased appraisal of choice alternative. Examples of this kind included

- Sundstroem's (1987) study of subjects who chose among apartments by using different information display boards,
- Klayman's (1983) study of children who made their decisions on some age-appropriate topics using different information boards,
- Bronner and De Hoog's (1984) study of subjects who made a choice from a self devised set of holiday destinations by means of a computerized decision aid, and
- Tyszka's(1989) three experiments on an information and evaluation process based on two types of information-search tracing techniques and the think-aloud technique that involved subjects who made choices on a variety of topics.

Dahlstrand and Montgomery's experiment involved twenty-six subjects choosing among five flats by interacting with a computer. The subjects were told to rate the attractiveness of each piece of information requested from the computer. They were also required, at regular intervals during the experimental session, to

rate how eligible each alternative was. The results showed (1) although most *S*s (subjects) required around 20 trials for reaching a decision, already after 10 trials 54% of the subjects rated the finally chosen alternative as more eligible than the others, and (2) by dividing the *S*s decision processes into three parts, denoted as the initial, middle and final part, 79% either paid most attention to the finally chosen alternative or had the highest mean evaluation of it, or both at the beginning of the last part of the decision process. Therefore, the results largely supported the assumption that decision-making involves a search for a dominance structure, that is, a representation of the decision situation in which one alternative is seen as dominant over the others. In particular, they showed that subjects tended to enhance their attention to and evaluation of the finally chosen alternative long before the actual choice.

Bronner and De Hoog's experiment involved forty subjects who made their choices on one of six holiday destinations, using a computerized decision aid program, an attribute reminder and a package tour booklet as their sources of information. The frequency with which the information facilities were used during the interactive session was: 50% used the attribute reminder, 23% the booklet, both were used by 10% and 28% did not use any information made available. The fact that the attribute reminder turned out to be far more popular than the booklet might indicate that extra information was functional for checking information that was already stored in memory or for justifying one's preference or decision (Bronner and De Hoog 1984). The experiment also revealed that those *S*s who had a particular preference for one of the six destinations before the computer session, or those for whom holidays played a larger role in their life perceived the program as being more applicable and helpful. These observations agreed with the concept of dominance, for the subjects having already a preference for a certain alternative used the program to support their evaluative judgments, which in turn resulted in a dominance structure.

All of Tyszka's three experiments addressed the question of limited and selective information acquisition of decision-makers. In experiments 1 and 2, in which students of architecture served as subjects, two decision tasks were used in each experiment: (a) selection of one out of six jobs for architects and (b) selection of one out of six books in architecture to be published. Experiment 3 involved architect and engineer (car designer) as subjects and the type of task was choice of one of five flats versus choice of one of five cars. The results showed that (1) subjects were highly concentrated on only a few alternatives indicated by rather high indices of variability, (2) it was the chosen alternative that almost always attracted the greatest number of questions, (3) subjects asked about different attributes for different alternatives, which might be an indication that the decision-maker already had some predetermined picture of the alternatives and was searching for additional information to supplement or confirm this picture, and (4) hints

of biased appraisal of choice alternatives were found in all experimental groups. Explicit de-emphasizing of negative aspects of the chosen alternative was observed in some instances. All the findings listed above leave no doubt about the selective and unequal interest of the decision-maker in various choice alternatives, and they are consistent with the basic idea of dominance structuring.

This chapter has presented several types of decisions with alternative decision strategies believed to be appropriate for dealing with each of them. In particular, it discussed, in the context of migration, several compensatory, non-compensatory and satisficing decision strategies under the condition of certainty, prospect theory as a descriptive theory of decision under risk, and search for a dominance structure describing the sequence of a decision-making process. The purpose of this chapter is to demonstrate how the problem of migration decision-making is formulated in this study and why certain decision strategies and theories are more appropriate than others in understanding migration decision-making behavior. Specifically, the migration decision-making problem is viewed as consisting of two parts: one is concerned with searching for a dominance structure where various decision rules are used. The other is concerned with assessing the risky place-related properties in the way described by the prospect theory. These two parts will be further discussed in Chapter 7 and 8, respectively. Survey findings of the Chinese immigrants will then be used to test the validity of the decision rules and prospect theory in describing migration decision-making behaviors.

Chapter 3

Review of literature on migration decision-making

Migration decision-making has been a focus of interest of several scientific disciplines over the last quarter century and has resulted in a substantial amount of literature. Contrary to the macro-oriented approaches that are largely concerned with the spatial regularities in migration streams and interrelationship between areas of in and out migration, the decision-making studies emphasize the evaluative process by which individuals arrive at decisions to migrate, the role of differential access to sources of information in shaping that decision, and the spatial patterns of search (Golledge and Stimson 1987). Although most of the studies are apparently discipline bound, the following review tries to bring together the various lines of inquiry under four major approaches of decision-making in migration. At the same time, the review does not intend to differentiate between literature on migration over different distances, within/across certain administrative boundaries, and for different reasons. The decision-making model to be constructed in this study is designed to be applicable to various types of migration, as long as the movements of migrants have been a purposive and voluntary matter. Although the empirical test of the model is restricted to a case of international migration in this study, more tests against data on other types of migration, such as rural-urban, intra-urban, and job-related migrations are expected in future studies. The purpose of this chapter is to provide a summary of what is known, as well as what is unknown about migration behavior of individuals. Those valid theories, concepts, and ideas will be absorbed by, or used to support the current study. Those aspects that are underrepresented in, or missing from the literature, on the other hand, point to the need for the current approach.

3.1. Concept of utility in migration

3.1.1. Wolpert's pioneering study

Wolpert is one of the pioneers who introduced human geographers to the behavioral alternative to the normative approaches. In his paper entitled *"The Decision Process In Spatial Context"* (Wolpert 1964), Wolpert challenged the normative concept of *"economic man"* as being free from the multiplicity of goals and imperfect knowledge which introduced complexity into our decision behavior. He pointed out that perfect knowledge was denied by the existence of unpredictable change and lag in the communication and perception of information. The decision behavior reflected not only the objective alternatives which were available, but also man's awareness of these alternatives and the consequences of their outcomes, his degree of aversion to risk and uncertainty, and his system of values.

Wolpert (1965) continued this theme with studies of human migration behavior. He introduced the concept of "place utility," which referred to the composites of utilities derived from an individual's place of origin in contrast to utilities from alternative places of residence. Place utility reflects the individual's subjective evaluation of a place in terms of his overall satisfaction or dissatisfaction with that place. It is expected that the individual locates himself at the place of highest utility. However, whether in fact the individual does so will be a function of (1) the information available on the utilities to be had elsewhere, and (2) the ability of the individual to adjust to the utility profile. In his study of migration behavior, Wolpert also raised the question of uncertainty avoidance by referring to Cyert and Marsh (1963) as saying that alternatives which minimized uncertainty were preferred and there was a tendency to postpone decisions and to rely upon the feedback of information. Uncertainty was also reduced by imitating the successful procedure followed by others.

Pryor extended Wolpert's place utility "further towards an emphasis on the complex and sometimes non-logical motivations of individual behavior" (Pryor 1976:106). He used the terms of "Subjectively Satisfying Place Utility (SSPU)" to define what was being evaluated and optimized by a migration decision-maker. Brown and Sanders (1981) provided another example of employing place utility as the measure of an individual's (or household's) overall level of satisfaction or dissatisfaction with respect to a given location. Migration was viewed "as a process of adjustment whereby one residence or location is substituted for another in order to satisfy the needs and desires of each migrant better, that is, in order to increase the place utility experienced at the residential site" (Brown and Sanders 1981:150). Like Wolpert, Brown and Sanders stressed the cognitive limits of the decision-maker and they believed that migration behavior was "likely to be intendedly rational, rather than actually so" (Brown and Sanders 1981:151).

Place utility was evolved from the normative utility theory. It also inherited the concept of maximization from the latter by assuming that decision-makers try to maximize something as they decide on one choice among several alternatives. The biggest contribution of place utility to the understanding of human migration behavior lies in its recognition of the differences in decision-makers' access to information and their capacities for comprehending and utilizing the information. A perfectly rational decision on a migration destination where place utility is maximized can only be obtained when the decision-maker has complete information about alternative potential destinations and has perfect skills in its use. Although a very useful and well accepted concept in the study of migration decision-making in the past twenty odd years, there is still room for a further development of place utility. The existing conceptualizations lack a specification on how exactly people make their decisions within their "bounded rationalities." More specifically, what is the typical way and the amount of information acquired, and what kind of decision strategies do people adopt if they do not obey the normative utility theory? Besides, the idea has not received many empirical validations over the years.

3.1.2. Value-Expectancy model

The psychological model, namely value-expectancy (V-E) model, states that the strength of the tendency to act in a certain way depends on the *expectancy* that the act will be followed by a given consequence (or goal) and the *value* of that consequence (or goal) to the individual (Atkinson 1964). De Jong and Fawcett (1981) have made the model relevant to migration behavior by calling for a specification of the personally valued goals that might be met by moving (or staying) and an assessment of the expectancy of achieving the goals in alternative locations through migration. The model can be expressed as follows:

$$M = \sum V_i E_i \tag{3.1}$$

where M= the strength of the motivation for migration;

V_i= the value of each of the outcomes following migration;

E_i= the expectancy that migration will have to each of the desired outcomes.

The model assumes that people choose from among alternative destinations the one corresponding to the strongest positive force, that is where M is maximized. As Vroom (1964) pointed out that this formulation is similar to the

notion in decision theory that people choose in a way that maximizes subjective expected utility. If utility (u_i) is substituted for value (V_i), and probability (p_i) for expectancy (E_i), formula (3.1) then becomes formula (2.1), which defines the expected utility of an action. Better specified than in the place utility conceptualization, the V-E model clearly stated that the overall strength of the motivation for migration (M) depended on adding up the product of the value of each goal and the expectancy of achieving that goal across all personally valued goals. However, another drawback still exists with the model in that it does not allow the differences in the importance of various goals to contribute differently to the overall strength of the motivation for migration. All goals are viewed as equally important in an individual's decision to migrate, which is hardly the case in real migration situations.

Based on a rather flexible structure and holding no particular assumptions about human behavior, the value-expectancy approach provides a method for measuring many of the factors that are likely to enter into the decision to migrate. The goals people hold that are likely to be associated with spatial mobility are identified and grouped into the following categories:

(a) **Wealth:** high income, luxuries, economic security in old age;

(b) **Status:** prestigious job, good education, power and influence;

(c) **Comfort:** "easy" job, comfortable housing, ample leisure time;

(d) **Stimulation:** fun and excitement, doing new things;

(e) **Autonomy:** economically independent, free to say and do what you want, having privacy;

(f) **Affiliation:** near family or friends, being with spouse;

(g) **Morality:** able to practice religion, exposing children to good influences.

The above seven categories of goals of migration have been employed by other authors in empirical studies of migration motivations (*e.g.*, Arnold 1987; Winchie and Carment 1989). According to De Jong and Fawcett (1981), it is possible to compute value expectancy peer scores for alternative destinations for each individual. The highest score would represent a propensity to move or to stay. The migration intention score is expected to be predictive of future mobility behavior. Besides, De Jong and Fawcett also identified personal traits; individual and household demographic characteristics; societal and cultural norms; opportunity structure, and available information as the main factors influencing the goals of migration and the expectancy of attaining the goals.

3.2. Cost-benefit analysis

3.2.1. Byerlee's conceptual model

Based on the literature of neo-classical economics, most microeconomic approaches to migration interpret the migration behavior within a framework of subjective costs and returns (Byerlee 1974; DaVanzo 1981). An individual will choose to migrate if he/she believes the benefits will exceed the costs. As an improvement from simple calculations of monetary costs and returns, Byerlee's (1974) framework addressed the multiplicity of the factors affecting the decision to migrate that also included non-economic or nonmonetary variables, such as psychic costs of the risk of unemployment, costs of breaking old and setting up new contacts, and costs of overcrowding and pollution in cities. Byerlee also identifies the contextual factors of land tenure system and the nature of rural-urban social networks as important influence to the balance of costs and returns.

DaVanzo (1981) later summarized the basic microeconomic model in the form of a mathematical formula, where the cost-benefit assessment was explicitly stated. The model also recognized that the benefits of migration occurred over a period of time. Symbolically, a person living in area i will move if

$$PV_{ij} = \sum_{t=1}^{T} \frac{U_j^t - U_i^t - C_{ij}^t}{(1+r)^t} > 0 \tag{3.2}$$

for at least one area $j \neq i$ and will choose the destination j where PV_{ij} is greatest, where PV_{ij} = present value of net gain of moving from i to j;

U_k^t = expected utility (or real income) in area k ($k = i$ or j) at time t;

j = potential destination;

i = origin;

r = discount rate ($0 \leq r \leq 1$);

T = expected length of remaining lifetime, and

C_{ij}^t = cost incurred in time period t of moving from i to j.

Although cost-benefit analysis of migration may serve as a useful starting point for a discussion of optimal migration decisions, it fails as a good descriptive method

in capturing the real mental process of a migration decision-maker. One apparent flaw of the method lies in its strict assumption that migration decision-makers convert all the factors affecting the decision to migrate into one single dimension and then compute their values. Another questionable yet related assumption is that decision-makers always make tradeoffs among factors. It is assumed that as long as its overall cost-benefit calculation receives the highest positive value, a place will be selected as migration destination. It does not matter if, for example, the place receives a very low value on its educational facilities, which in fact may be of great concern to the decision-maker. In real life, many people tend to compare places by aspects, rather than assigning an over all cost-benefit value to the places. An empirical study conducted by Gould and White (1986) in fact suggested that people tried to avoid making tradeoffs in their evaluations about different places.

3.3. Dealing with risk in migration

3.3.1. Todaro's consideration of uncertainty

Although basically a macro-level approach, Todaro's model is included in this review for it is one of the few studies that have paid particular attention to the risks involved in the migration process. Todaro's model of migration is a milestone in the economic approach to migration behavior. It broke with the assumption implied in most conventional studies that potential migrants knew exactly how much the move would cost and what benefits would it bring to them. Also rooted in the microeconomic theory of migration as an investment in human capital, the essence of Todaro's model is that the decision to migrate, in the context of rural to urban migration, depends on "expected" rather than actual urban-rural real wage differentials where the "expected" differential is determined by the interaction of two variables, the actual urban-rural wage differential and the probability of successfully obtaining employment in the urban modern sector (Todaro 1969; 1976). The amount of rural-urban migration, according to Harris-Todaro model (Harris and Todaro 1970), the modified version of the basic Todaro model, is expressed by the formula:

$$M = f(E(W_u) - E(W_r)) \tag{3.3}$$

and

$$E(W_u) = W_u \frac{E_u}{L_u} \tag{3.4}$$

where M = the amount of rural-urban migration;

$E(W_r) = W_r$ = the real agricultural wage rate;

$E(W_u)$ = the *expected* urban income (wage);

W_u = the real urban income (wage);

E_u = the urban labour force in employment;

L_u = the total urban labour force; and

if $E(W_u) - E(W_r) = 0$ then $M = 0$.

Although the fundamental premise of Todaro model postulated that "migrants as decision-makers consider the various labour market opportunities available to them, ..., and choose the one which maximizes their 'expected' gains from migration" (Todaro 1976:28-29), Formulas (3.3) and (3.4) do not exactly account for the evaluation or decision of individual migrants. The ratio between E_u and L_u does not represent an individual's perception of his/her chance of being employed in the urban area, since different people possess different levels of skills and therefore they view themselves as having different opportunities. Furthermore, the difference in average incomes between rural and urban job opportunities does not have an equal effect on all potential migrants since each individual earns differently. Therefore, the model cannot predict a decision-maker's propensity to migrate. Another important issue that Todaro's model failed to address is that people actually make tradeoffs between the urban income they expect to earn and the probability of obtaining an urban job. Because of the "certainty effect" (Kahneman and Tversky 1979), an 80% probability of earning $4,000 in city A is not necessarily preferred over a 100% probability of earning $3,000 in city B, although the "expected gains" defined by Todaro is higher in city A. Therefore, although Todaro's approach to risk in migration might be useful in predicting the overall migration flows between rural and urban areas, it is not very helpful in describing individuals' perception of risk, nor in explaining their choice behavior in migration.

More studies dealing with risks in migration have emerged since Todaro. One type of approach simply introduced modifications and extensions to the Todaro or the Harris-Todaro model, such as by Fields (1975) and Smith (1979). Another type of approach focuses more on the individual's decision to migrate (David, 1974; Miron 1978). David's work, based on a more rigorous use of microeconomic principles, assuming that individual prospective migrants knew the probability

distribution of wage offers and could attach specific values to every job offer. They would then conduct sampling of offers and visiting firms before they made a decision on which job to take. A common drawback of the above studies on migration decision-making under risk is that all of them treat migration behavior as equivalent to job-search behavior. It hinders the applicability of those approaches since in most cases, migration occurs for multiple reasons. Potential migrants want to achieve various goals by migration, and they sometimes have to make tradeoffs among various goals. In other words, migration decisions in the real world are more complicated than what has been covered by the above economic approaches to risks in migration.

3.4. Stages of migration decision-making

3.4.1. Brown and Moore's two-stage model

Inherited from the concept of place utility (Wolpert 1965), Brown and Moore (1970) also saw the decision to migrate as a result of an individual's dissatisfaction with respect to a given location. Migration was viewed as a process of adjustment whereby one residence was substituted for another in order to increase the place utility experienced at the residential site. However, instead of focusing only on the factors affecting the overall evaluation of the place utility, the model looked one step back to the beginning of the process through which the evaluation of place utilities had been conducted and the final decision of where to relocate had been reached. It tried to elaborate the social-psychological dimensions of migration decision-making process by dividing the process into two phases (Brown and Moore 1970; Brown and Sanders 1981):

Phase I: The decision to seek a new residence In phase I, the individual or household is seen as continually evaluating the congruence between its needs or expectations and the offerings associated with the present residential site. The disparities between needs or expectations and environmental offerings give rise to stress, which in turn leads to some coping behavior if a threshold level is exceeded. Three kinds of coping behavior are identified:

1. adjusting its needs;

2. restructuring the environment relative to the household so that it better satisfies the household's need. Either of the above two would result in a decision not to migrate; or

3. relocating the household, either in part or in whole.

If the last kind of coping behavior is perceived as a viable alternative, the decision-maker moves to the next phase, which is a decision to seek a new residence. It may happen that the search for a new residence is sufficiently frustrating that the decision-maker later decides to (1) adjust its need set or (2) restructure its present environment rather than continue to search.

Phase II: The relocation decision Once the individual or household has decided to seek a new residential location, a search process is undertaken. The individual's mental or cognitive map which, together with the need set, defines an initial search space composed of places that seem generally attractive. The actual opportunities offered by each place are made known through a variety of information channels such as the media, government or private agencies, and interpersonal contacts. As a result of the search, the potential migrant will identify some places for serious evaluation. If those places have characteristics that are congruent with the migrant's aspirations, an actual migration is likely to occur. Alternatively, the migrant might decide either to revise the search strategy and continue looking, or to abandon the search and remain in the original residence. In the latter instance, then, the process returns to Phase I.

3.4.2. Haberkorn's conflict model

Haberkorn's (1981) model of migration, like that of Brown and Moore', focuses on the thought process of the decision-maker. Without mentioning place utility, Haberkorn's approach was fully based on a psychological model, namely a "conflict model of decision-making" proposed by Janis and Mann (1977). The conflict model of decision-making regards decisional conflicts as a source of stress and attributes the intensity of physiological, psychological and social symptoms to the perceived magnitude of anticipated losses resulting from the decision.

Based on the assumption that "migration is influenced by a decision-making process similar to the one underlying any other important, conscious, voluntary, and goal-directed behavior" (Haberkorn 1981:253), Haberkorn introduces the conflict model of decision-making to the context of migration decision. The study provides a cohesive and systematic approach to the analysis of some social-psychological factors as they may affect an individual's migration decision-making process. Migration decision-making process is divided into five stages as follows:

Stage 1: Appraising the challenge
The beginning of a migration decision-making process takes place whenever a person is confronted with a specific event or information that either "calls his

attention to a real loss soon to be expected," such as the anticipation of being unemployed; or suggests an opportunity "effectively challenging the current course of action" (Janis and Mann 1977:172), such as information about better-paid jobs elsewhere. The major concern and key question to be dealt with at this stage refers to the risks involved in adhering to the present location. However, whether or not certain objective criteria would initiate a migration decision-making process is determined by an individual's characteristics in terms of willingness to take risks, feeling of uncertainty, mobicentric[1]/pioneer[2]personality, degree of social integration to the old community, and the person's level of achievement motivation.

Stage 2: Surveying alternatives

After accepting this initial challenge and questioning the present situation, a potential migrant will have to search his environment actively for alternative destinations. The main purpose of this stage is to come up with a set of variables that will provide the basis for a more thorough evaluation. Concrete desires or expectations play an important role in determining a person's search behavior, as well as negative expectations with regard to staying at their place of origin. Meanwhile, constraints such as costs of the move and the individual's perception of available destinations sometimes cause people to settle for less desirable places.

Stage 3: Weighing alternatives

Each alternative destination surveyed in Stage 2 is now carefully screened with regard to every possible advantage and disadvantage and tested by being "tried on mentally" (Janis and Mann 1977:174). The basic problem to be solved at this stage is finding the best alternative that meets the essential individual requirements. There are basically two types of strategy for weighing alternatives. One requires the potential migrant to judge each possible alternative destination according to specific criteria, including personal and social expectations, values, and norms. The other one is dual comparison between all possible alternative destinations. Cognitive and functional fixedness on only one particular aspect usually affects the decision-maker at this stage. For example, a person's former association of migration with making more money can lead to his being unable to see any other potential benefit of out-migration.

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[1]The term "mobicentric man" was first used by Jennings (1970) to describe a peculiar behavior of people who are constantly on the move, who values motion and action very highly.

[2]The term "pioneer personality" was introduced by Morrison and Wheeler (1976) referring to a personality to whom "almost any place will do as long as it is another place." This notion draws clear parallels to Petersen's (1958) concept of innovating migration (Haberkorn 1981).

Stage 4: Deliberating about commitment
After successfully settling for one specific alternative, the decision-maker will be faced at this point with the problem of whether he should convey his intention to others and implement his decision. The need for social approval is widely considered as one of the most fundamental psychological needs. At the same time, the decision-maker will try to think up ways of avoiding disapproval from others, such as family, friends, and other reference groups.

Stage 5: Adhering despite negative feedback
The actual decision-making process is finished at this point. The post-decision period, however, quite frequently contains doubts and regrets concerning the new course of action, stimulated by new or existing opportunities and information (alternatives) perhaps ignored during Stage 2–4. The individual may find himself once more at Stage 2, or may conduct some coping strategies such as to undo the decision, *i.e.*, to return to his place of origin without considering other alternatives, to omit the most distressing acts that are the prime sources of regret and do exactly what he came for, or to reaffirm the original decision through the development of defensive attitudes, such as to exaggerate positive consequences by adding up all he can think of.

Both Brown and Moore and Haberkorn's studies tried to reveal the mental process of a migration decision-maker as he/she looked for a new place of residence. Both studies have offered a good explanation of the way a decision-making process is initiated, and discussed the factors affecting the thought process as it proceeds from one stage to another. Although both studies have identified the existence of information search and evaluation of alternative potential destinations in the process, they share the same drawback of lacking a sound and detailed description of how those searches, evaluations and comparisons have been conducted, and what decision strategies have been involved in the operations so that the decision-maker could find the best destination among different alternatives.

3.5. Existing literature and the current research

In view of the existing literature of research on the migration decision-making process, the following points need to be addressed, which summarize the major shortcomings that exist in the literature. They will, at the same time, indicate why the current research is important and how it can help to fill some gaps in the existing literature.

Place utility

Wolpert (1965:163) defined the concept of place utility as:

> ...a positive or negative quantity, expressing respectively the individual's satisfaction or dissatisfaction with respect to that place.

Apparently, the definition refers to the overall evaluation of a place. However, people do not usually evaluate a place on a single dimension. Job opportunity, cost of living, local scenery, climate, and school facilities are, for example, considerations that frequently enter into people's evaluation of a place. In cases of international migration, factors such as the possibility of obtaining an immigration visa, general economic situation, cultural and linguistic variety, political and racial attitude, may also be counted. The overall evaluation of a place can hardly be obtained without first decomposing the task into the evaluation of each property or dimension of each place. Neither the definition given by Wolpert nor Pryor specified how the overall place utility could be assessed or measured, although "characteristics" of a place was mentioned by Wolpert in that "[T]he individual will tend to locate himself at a place whose characteristics possess or promise a relatively higher level of utility than in other places which are conspicuous to him" (p.163). The lack of an operational specification of the way place utility is assessed may be one of the reasons why the theory never received many empirical verifications. In addition to the lack of division of place-related properties into independent dimensions, the different importance of the properties to a decision-maker is another aspect that affects their evaluation of the overall level of utility of a place. Yet this is left out by Wolpert's formulation. What if a place has perfect scenery but very few job opportunities, and the decision-maker is looking for a job? Will the level of utility of that place be high? A normative theory will help indicate how to conceptualize and solve this kind of problem. It is the multiattribute utility theory (MAUT) that was discussed in Chapter 2. Later in this research an attempt will be made to prove, through an empirical test of the model of search for dominance structure, that people may or may not really add up the weighted single dimension utility across all the various properties of a place to get an overall evaluation of that place, and then choose the place with the highest overall place utility, as is suggested in MAUT. They may have other simpler ways of assessing the overall utility of a place. However, the concept remains true that the overall level of utility of a place depends on the utility of its individual properties, and the importance of each of the properties to the decision-maker. It is believed that the higher the utility of a property and its weight of importance to a decision-maker, the more strongly the property will affect the evaluation of a place.

Compensatory vs. noncompensatory strategies

Many existing analyses (*e.g.,* cost-benefit analysis, value-expectancy model) assume that individual decision-makers use a single linear model in which components are added together to form an overall evaluation, or a summary assessment. They then choose the alternative with the maximum value, which might be the highest place utility or the result of a cost-benefit calculation. However, other studies (*e.g.,* Einhorn 1971; Wiggins and Hoffman 1968) suggest that decision-makers do not always believe that they are using linear additive models in their cognitive activity. Instead, they use nonlinear, noncompensatory methods for combining information. This is because, as was pointed out by Einhorn, nonlinear, noncompensatory models are relatively easy to use cognitively, even if they are more complex mathematically. For example, in order to select potential migration destinations, a migration decision-maker does not add the advantages and disadvantages of each place together to calculate a total utility or total gain. Instead, he/she may use a cutoff-type procedure to select those that meet the requirement of a set of properties of a place. The decision task is thus much simplified. This is a conjunctive method, a nonlinear and noncompensatory one. This study attempts to find out the extent to which compensatory and noncompensatory decision rules are involved in a migration decision-making process. The eight decision rules discussed in Chapter 2, including dominance rule, conjunctive rule, disjunctive rule, lexicographic rule, elimination by aspects rule, maximizing number of attributes with a greater attractiveness rule, addition of utilities rule, and the satisficing rule will be examined against the decision-making experience of the Chinese immigrants for that purpose.

Model of decision procedure

Some studies (*e.g.,* Brown and Moore 1970; Haberkorn 1981) have paid attentions to the mental process of a migration decision-maker. They identified the way a decision process is started, the sequence of stages the decision-maker goes through and the major factors that affect each stage of the decision-making process. However, they did not provide a sound and detailed description about how the evaluation of each alternative migration destination and comparisons among the alternatives are conducted, what kind of decision strategies are used to combine information, or play an important role in the individual's decision to choose a particular migration destination. Again, the examination of the above mentioned eight decision strategies in this study will provide a clue to those questions.

Choice under risk

Although a number of studies have tried to address risk and uncertainty in migration decision-making (*e.g.,* Wolpert 1965; Brown and Moore 1970; David 1974; Todaro 1976; Goodman 1981), those that have appeared in a form of a rigorous theory or model (*e.g.,* Todaro 1976; David 1974) focus exclusively on job-search behavior. However, migrations are motivated by other reasons, too. Typically when decision-makers try to decide on where to move, they consider various economic, social, political and environmental factors as are suggested in the place utility model, cost-benefit analysis, and the value-expectancy model of migration. Risk and uncertainty exist in the availability of jobs and income level, and likewise they may exist in other factors that concern the decision-maker. Thus, it is important to extend the issue of risks in migration decision-making into a more general context, to understand how various risky properties associated with the places of interest to potential migrants are perceived by them, and how their perceptions of risks affect their overall evaluations of a particular place. In this study, living standard, occupation, social status, and political stability were specified as factors that might enter into the Chinese immigrants' consideration of potential destinations. Furthermore, their perceptions of those risky properties have been examined in the way they assigned values to each of the properties, weighed the probabilities of their occurrence, and gave preferences to one destination over another based on their evaluations. The theoretical basis for the approach is prospect theory. Data were collected from the questionnaire survey of Chinese immigrants to verify relevant propositions.

Information search behaviors

The existing literature does not offer much insight into the relationship between decision-makers' cognitive limits and their information search behaviors. There is no lack of findings regarding the major sources of information such as relatives, friends, market-information sources such as newspaper and TV, and government sources (*e.g.,* Goodman 1981; Haberkorn 1981; Brown and Sanders 1981). Other studies have also tried to asses the utility or cost-benefit of information search, or the optimal search of information (*i.e.,* David 1974, Goodman 1981). In this study, an effort has been made, through the survey of Chinese immigrants, to further address issues such as how people being "intendedly rational" can be illustrated by the amount of information searched and the way information is processed, and how the patterns of information search are related to the decision strategies adopted by the decision-makers.

Empirical verification of decision models

Last but not the least, ther is an apparent gap between theoretical and empirical approaches to migration decision-making. Since most of the studies are based on theories that are rooted in other scientific disciplines (*e.g.*, utility theory, microeconomics, motivation theory, psychological theory on human decision-making), they are basically concerned with conceptual rather than operational approaches. There has been a lack of empirical tests of those models to verify their validities. Some basic questions have never been addressed very well because of the lack of empirical studies, such as how rational or irrational are the general population when they make decisions to migrate? To what extend are they satisficers or maximizers? Do they really make tradeoffs or compromises between different goals of migration? The major purpose for including an empirical study of Chinese immigrants in this study was to verify the theoretical propositions developed to describe human migration decision-making behavior, which would in turn provide answers to the above questions. Although one successful test will not turn the propositions into a law, it can at least show them to be acceptable generalizations (Johnston 1979).

Chapter 4

Background information on Chinese emigration to Canada

The empirical part of this research is concerned with the recent Chinese immigrants in Canada. A sample was drawn in Edmonton, Alberta from independent immigrants who are of Chinese origin and arrived in Canada between 1985 and 1990. This chapter offers a brief review of recent Chinese immigration to Canada, in terms of the amount of inflow over the five year period, the demographic features of the immigrants and their reasons for emigration. Restricted to the available information, this review is biased towards Hong Kong immigrants, who constitute the majority of the recent Chinese immigrants to Canada, as well as the target population of the current study. Studies focusing on other major sources of Chinese immigrants, such as China, Taiwan, Singapore, Brunei and Malaysia, are rare. Even those concerning Hong Kong emigration, mostly from journalistic reports, indicating considerable public interest in the topic, have shown a marked absence of hard data as well as a relative paucity of serious research on the subject. This review, although it may not yield much hard evidence or in-depth analysis, it is nevertheless useful in offering some insight into the background of Chinese immigrants and the general socio-economic and political environments underlying the migration wave. It will also enhance the importance of this study by demonstrating the importance of Chinese immigrants in today's Canadian economy and society.

4.1. The size of the inflow of Chinese immigrants

Canada has witnessed a large inflow of Chinese immigrants since the mid-1980s. In fact, in a list of top ten countries of last permanent residence that have provided the largest number of landed immigrants, Hong Kong ranked No.1 from 1987 to 1990, second in 1985 and fourth in 1986. China ranked tenth in 1989 and eighth in 1990 (Employment and Immigration Canada: 1985;1986;1987;1988;1989;1990). In addition to Hong Kong and China, other major sources of Chinese immigrants include Taiwan, Singapore, Malaysia, and Brunei. Table 4.1 gives an estimate of the number of Chinese immigrants who arrived in Canada between 1985 and 1990. Since Chinese account for only 25% of the total population of Brunei and 32% of the total population of Malaysia (Johnson 1990), numbers entered into Tables 4.1 through 4.5 under Brunei and Malaysia are the total number of immigrants from the two sources multiplied by 0.25 and 0.32, respectively. It is understood that Chinese are likely to be over-represented in both countries' emigrant population, since as will be shown later, Chinese in those two countries are motivated to leave because of political reasons; in addition, the fact that Chinese are generally wealthier than the other ethnic groups also makes it easier for them to emigrate. However, there is no official information regarding the proportion of Chinese in those two countries' emigrant population, so their proportions in the general population have to be used. About 22% of the emigrants from Singapore are non-Chinese (Balakrishnan 1989b). But the total numbers of Singapore immigrants to Canada are entered into Tables 4.1 to 4.5, which will help compensate some of the under-estimates from Brunei and Malaysia. Tables 4.1 to 4.5 may also under-estimate the total number of Chinese immigrants because they omitted other sources such as Vietnam, the Philippines, Indonesia, Laos, and Macao. Again, the main reason is that it is too difficult to estimate the proportions of Chinese in those countries' emigrant population.

As Table 4.1 shows, Hong Kong is the largest source of Chinese immigrants, accounting for 71.2% of the total from 1985 to 1990. China ranks the second, accounting for 15.1% while Taiwan is the third, accounting for 8.4% of the total Chinese immigrants. With the exception of 1986, the annual number of total Chinese immigrants increased steadily over the years. The average proportion of Chinese in the total number of immigrants who arrived in Canada over the six year period is 15.8%, ranging from the lowest 8.9% in 1986 to the highest 19.9% in 1990. It is safe to say that Chinese constitute one of the largest immigrant groups to Canada in recent years.

Nearly three quarters of the Chinese immigrants belong to the classes of independent immigrants (Table 4.2) (For the definition of classes of immigrants, see *Appendix B*). Except from China and Malaysia, independent immigrants account for over 80% of the total immigrants from each of the other sources. "Other in-

Table 4.1: Chinese immigrants by country of last permanent residence and year of landing: 1985–1990

Country	1985	1986	1987	1988	1989	1990	Total	%
Brunei	15	25	81	326	233	142	821	0.6
China	1883	1902	2625	2778	4430	7989	21607	15.1
Hong Kong	7380	5893	16170	23281	19908	29261	101893	71.2
Malaysia	106	134	229	536	620	525	2150	1.5
Singapore	166	220	489	1141	1634	1077	4727	3.3
Taiwan	536	695	1469	2187	3388	3681	11954	8.4
Total	10086	8869	21061	30250	30212	42675	143152	100.0
% of total immigrants to Canada	12.0	8.9	13.8	18.7	15.7	19.9	15.8	

(Source: Employment and Immigration Canada 1985;1986;1987;1988;1989;1990, adjusted to the proportions of Chinese in Brunei and Malaysia)

dependent" immigrants is the largest class for all sources, while "Entrepreneur" is the second largest for Hong Kong, Malaysia, Singapore and Taiwan, and "Assisted relative" is the second largest for Brunei and China. The last two rows of Table 4.2 give a comparison between the composition of Chinese immigrants and that of the total immigrants to Canada. Independent immigrants account for 74.7% and 46.8% of the Chinese immigrants and total immigrants to Canada, respectively. Consequently, "Family" and "Refugee" classes together accounts for 25.3% and 53.2% of Chinese and total immigrants to Canada, respectively. Furthermore, there is a much larger proportion of "Investors," "Entrepreneurs," and "Other independent" immigrants in the population of Chinese immigrants than in the total flow of immigrants to Canada. The proportions of assisted relatives and self-employed immigrants are smaller among the Chinese than in the total immigrant intake.

One of the noticeable features of recent Chinese immigrants is their domination in the business classes, especially in the classes of investors and entrepreneurs, where the Chinese were well over-represented every year from 1985 to 1990 (Table 4.3). In fact, Hong Kong has been the leading source of business immigrants by a considerable margin since 1984. Hong Kong has also been the leading source of investors every year, immediately followed by Taiwan since the program was introduced in 1986.

Alberta received 14,135 Chinese immigrants from 1985 to 1990, which accounted for 9.9% of total Chinese immigrants to Canada (Table 4.4). Proportions of people who landed in Alberta from difference sources ranges from 3.7% from Taiwan to 57.5% from Brunei. Ontario and British Columbia have attracted the majority of Chinese immigrants from all sources except Brunei. Quebec has also

Table 4.2: Chinese independent immigrants by country of last permanent residence and class: 1985–1990

Country	Assisted relative	Entre-preneur	Self-employed	Investor	Other independent	Total	% of total from the country
Brunei	86	53	1	2	535	676	82.4
China	2874	108	87	24	5192	8285	38.3
Hong Kong	5484	20374	691	3925	51822	82296	80.8
Malaysia	104	396	24	15	964	1502	69.9
Singapore	323	487	43	59	2999	3911	82.7
Taiwan	351	4848	124	2369	2553	10245	85.7
Total	9222	26266	970	6394	64065	106915	74.7
Composition of Chinese immigrants to Canada	6.4%	18.3%	0.7%	4.5%	44.8%	74.7%	
Composition of immigrants to Canada	9.7%	6.2%	1.4%	0.9%	28.6%	46.8%	

(Source: Employment and Immigration Canada 1985;1986;1987;1988;1989;1990, adjusted to the proportions of Chinese in Brunei and Malaysia)

Table 4.3: Chinese immigrants as a % of total immigrants to Canada, by class and year of landing

Year	Assisted relatives		Entre-preneur		Self-employed		Investor		Other independent		Family & Refugee	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1985	615	8.3	2907	58.6	119	7.8	/	/	1441	9.5	5004	9.1
1986	663	11.3	2795	47.6	4	2.5	14	60.9	1671	6.8	3722	6.1
1987	1361	11.1	3769	44.7	55	2.4	225	71.2	10311	19.2	5340	7.1
1988	1604	10.3	5249	46.2	182	6.7	732	71.2	17116	32.2	5367	6.9
1989	1543	7.2	5819	44.8	269	11.7	1835	80.8	13811	25.0	5392	7.1
1990	3436	13.5	5727	46.7	304	15.4	3588	85.3	19715	34.4	9905	8.8
Total	9220	10.5	26266	47.0	933	7.5	6394	81.5	64065	24.8	34730	7.2

(Source: Employment and Immigration Canada 1985;1986;1987;1988;1989;1990, adjusted to the proportions of Chinese in Brunei and Malaysia)

attracted more from Taiwan and Hong Kong than Alberta has. Assuming the proportion of independent Chinese immigrants to Alberta is the same as that to Canada as a whole, which is 74.7% (Table 4.2), the number of independent Chinese immigrants who arrived in Alberta between 1985 and 1990 is estimated to have been at 10,559.

Table 4.4: Chinese immigrants to Alberta, by country of last permanent residence and year of landing

Country	1985	1986	1987	1988	1989	1990	Total	% of total from the country
Brunei	6	11	45	203	131	76	472	57.5
China	208	217	283	312	570	1259	2849	13.2
Hong Kong	704	632	1833	2257	1619	2548	9593	9.4
Malaysia	13	20	27	70	84	72	286	13.3
Singapore	16	31	50	93	171	127	488	10.3
Taiwan	30	41	56	100	99	121	447	3.7
Total	977	952	2294	3035	2674	4203	14135	
% of total Chinese immigrants to Canada	9.7	10.7	10.9	10.0	8.9	9.8	9.9	

(Source: Employment and Immigration Canada 1985;1986;1987;1988;1989;1990, adjusted to the proportions of Chinese in Brunei and Malaysia)

4.2. Other demographic features of Chinese independent immigrants

Slightly more female than male Chinese immigrants who arrived in Alberta from 1985 to 1990 from all sources except Brunei (Table 4.5). Since there is a lack of information regarding age, level of education, and knowledge of official languages for all Chinese immigrants arriving in Alberta, Tables 4.6, 4.7 and 4.8 are limited to those who came from Hong Kong; they make up nearly 70% of total Chinese immigrants to Alberta.

Immigrants from Hong Kong are relatively concentrated in the middle age (25–44) group and are better educated compared to the general population of Canada (Table 4.6 and 4.7). While people under 15 or over 65 years of age together account for 32.0% of the total population of Canada, they account for 23.8% of the Hong Kong immigrants. Those who have obtained secondary or

Table 4.5: Chinese immigrants arrived in Alberta, by sex and country of last permanent residence: 1985–1990

Country	Male		Female	
	No.	%	No.	%
Brunei	238	50.6	232	49.4
China	1328	46.6	1521	53.4
Hong Kong	4683	48.8	4910	51.2
Malaysia	226	46.3	262	53.7
Singapore	222	49.7	225	50.3
Taiwan	132	46.0	155	54.0
Total	6829	48.3	7305	51.7

(Source: Employment and Immigration Canada 1985;1986;1987;1988;1989;1990, adjusted to the proportions of Chinese in Brunei and Malaysia)

Table 4.6: Age distribution of Hong Kong immigrants to Alberta: 1985–1989

Age group	Number	% of total	Age distribution of Canadian population (1986)
0-14	1,304	18.9	21.3
15-24	849	12.3	16.5
25-44	3,387	49.1	32.3
45-64	1,017	14.8	19.3
65+	336	4.9	10.7

(Source: ACDE 1990a; Statistics Canada 1991)

Table 4.7: Levels of education of Hong Kong immigrants to Alberta: 1985–1989

Class	Secondary or less	Some postsecondary Trade certificate	University degree
Assisted relatives	179	97	59
Entre. & Self employed	659	336	36
Retired	157	76	17
Investor	35	2	6
Other independents	1426	1071	729
Total	2456	1582	847
% of total	50.3	32.4	17.3
Levels of education of Canadian population (% of total population)	60.2	30.2	9.6

(Source: ACDE 1990a; Statistics Canada 1989)

Table 4.8: Official language capability of Hong Kong immigrants to Alberta: 1985–1989

Class	English	French	Bilingual	None
Assisted Relatives	193	4	2	136
Entre. & self employed	415	0	0	618
Retired	116	0	0	135
Investor	16	0	0	27
Other independents	2,187	5	18	1,018
Total	2,927	7	20	1,934
% of total	59.9	0.1	0.4	39.6

(Source: ACDE 1990a)

less education account for 60.2% of the total Canadian population, compared to 50.3% of the Hong Kong immigrants. On the other hand, those who have obtained university degrees account for 9.6% of the total Canadian population, compared to 17.3% of the Hong Kong immigrants. Apparently the latter have to be better qualified professionals and successful businessmen because otherwise they would not have been accepted as qualified applicants. Over half of the Hong Kong immigrants could speak either English, French, or both. The proportion increased considerably from 42.5% of those who arrived in Canada between 1980 and 1984.

4.3. Reasons for emigration

The subject of emigration began to attract media and public attention in Hong Kong in late 1987 when there were signs that more and more people were leaving. A Hong Kong government task force was established in 1988 to ascertain the facts, and it concluded that 30,000 persons emigrated in 1987 and 45,800 in 1988 compared to a historical average of around 20,000 in the early 1980s. The forecast for 1989 was 42,000 (Roberts 1989). On October 11, 1989 when the Governor, Sir David Wilson made his annual address to the Legislative Council, he further pointed out that the "estimate (42,000 people would leave Hong Kong in 1989) remains valid. But emigration levels are likely to be higher in the next few years" (Wilson 1989:5). People in Hong Kong also feel the real exodus from Hong Kong is not yet underway, and that the real flight will begin in 1992 when the people have only five years left to establish themselves in another country (Cannon 1989). An estimate by a group of British Members of Parliament put the number of people who will want to flee in the event of a major emergency at a minimum of one million (Downton 1986).

It is widely believed that it is the fear of living under Chinese communist rule after 1997 that is driving many Hong Kong families "to seek the right of abode in English-speaking countries in the West" (Lau 1987:23). On December 19, 1984, the United Kingdom and China signed an agreement on the future of Hong Kong, according to which on July 1, 1997 when Britain's ninety-nine year lease on the major part of the territory expires, this territory together with the rest of the British crown colony will be returned to Chinese sovereignty. The agreement provides for the establishment of Hong Kong as a Special Administrative Region within China until at least 2047. Therefore, Hong Kong may until then retain its capitalist economic system and will have a wide range of autonomous powers, including a separate currency, a free port, and freedom to regulate travel in and out. Nevertheless, there is still considerable uneasiness about the long-term viability of the Hong Kong agreement. Skeptics point out that mainland China has undergone tremendous political changes in the past three decades, that its current leaders are old, and that new political leaders in China might not respect the agreement (East-West Center 1986). It is the uncertainty surrounding Hong Kong's political and economic future that is pushing people to emigrate, even though "many of them do not really want to go" (Wilson 1989:5).

Some evidence might further indicate that the Hong Kong emigrants' only interest is to secure a foreign bolt-hole. For example, many husbands, mostly in the classes of business immigrants, sent their wives and children abroad to their new countries to serve out immigration residency requirements of from two to three years while they, themselves, continue to work in Hong Kong. After becoming permanent residents or citizens of their adopted countries, some of these families return to Hong Kong to work as expatriates (Lau 1987). When interviewed by a Canadian reporter, a Hong Kong resident said "I don't want to live anywhere else, but I don't like the idea of the Communists—they can't be trusted. No one really wants to leave but it's essential to get citizenship in another country . . . We get citizenship and then we come back here" (Cannon 1989:61-62).

The big outflow of people and financial resources from Hong Kong entails a drain on the talent of the territory. A rift over the official handling of Hong Kong's brain-drain problem has developed among senior government officials in Hong Kong (Lau 1989). The number of people able to emigrate depends on how many will be accepted by the receiving countries, with acceptance determined heavily by an applicant's education, skills and experience. The screening process heavily favors just the sort of people Hong Kong needs most to maintain its position as a vibrant international trading and financial center. One senior official, who asked not to be identified, privately warned that the continuing exodus of middle-class professionals will reach crisis proportions by 1993-94 (Lau 1989).

Emigration is also a big concern to the government of Singapore. About 3-4,000 Singaporeans are emigrating yearly—mostly to Australia and Canada. Since

a substantial proportion of the emigrants are professionals, "the island republic is suffering a brain drain of such proportions that it has been described by one minister as a 'time bomb ticking in our midst' " (Balakrishnan 1989a:32). A government committee was set up to formulate policies to stem the outflow and a decision was also made to lure Hong Kong professionals to migrate to Singapore (Balakrishnan 1989a; 1989b). The main reason for emigration, according to prospective emigrants and embassy personnel who deal with them (Balakrishnan 1989a), is the uncertainty about the future for their children. Singapore's education system is intensely competitive, with children being streamed into academic and vocational channels very early on. Those who do not make it into academic channels have little likelihood of making a good living in a society that swears by paper qualifications. A substantial portion of Singapore's Chinese middle class, for whom English is often a first language, generally feel that the education systems in Australia and Canada are better. The greater English fluency of these people makes it easier for them to migrate to those countries. Semi-skilled emigrants cite very mundane reasons for leaving, such as inability to own cars or houses which are too expensive. The lack of political freedom is only cited as a minor reason for emigrating.

4.4. Reasons for coming to Canada

The large inflow of Chinese emigrants to Canada would not have been possible had Canada not started to pursue a policy of moderate, controlled growth in 1985. This change followed the retrenchment which resulted from the 1981-1982 recession (Employment and Immigration Canada 1989). Canada formally implemented a new entrepreneurial immigration program in January 1984. The new policy directives are aimed at enlarging the definition of those eligible under the program and increasing the speed of their processing. In January 1986, a new Federal Investor Program was introduced as another component of Canada's business immigration program, designed for qualified business people with a higher net worth than those in the entrepreneur component who might not want to be actively involved in the management of a business (Nash 1987). As a result, the number of immigrants into Canada, especially those under business categories has increased steadily since 1984. Also since 1984, Hong Kong has come to dominate the flow of business immigration "to such an extent that even the perennial second and third ranked sources (the United States and West Germany) seem minor players" (Nash 1987:18).

Limited options is the main reason that has brought such a large volume of immigrants into Canada. This can be learned from the immigrants themselves. One Hong Kong emigrant has revealed that many of them would rather go to the

United States. It was the America's strict quota on Hong Kong Chinese—only 600 are allowed in each year—that caused them to end up in Canada. Some people also believe that if the U.S. House of Representatives passes the new immigration bill, which would permit special immigration status to entrepreneurs, then the rush of Hong Kong Chinese to Canada will stop, and many who are already here will leave for the U.S (Cannon 1989).

In addition to the fact that Canada has one of the most liberal immigration policies in the world, there are other reasons that might contribute to Chinese emigrants' decision to come to Canada. Since a significant proportion of them are entrepreneurs or investors, a study by Goldberg (1985) on the investment behavior of overseas Chinese[1] has offered some insight into why many Chinese are attracted to Canada. First, the presence of family, friends and business acquaintances in the city where the investment is to be made is very important. They are by far the most important information sources, since traditionally, Chinese tend not to trust people they do not know. Moreover, visits to foreign countries to see family members provide additional opportunities for potential investors to make contacts and to see properties or merely to get the feel of the local or regional property market. Consequently, a migration chain is likely to be formed and attract more and more emigrants to Canada. Secondly, there is an obvious connection between education and real estate investment abroad. It is interesting to observe that one of the most frequently cited reasons given for interest in Canadian real estate was the enormous number of Hong Kong residents who had attended universities in Canada. Canada is seen as providing excellent university educations with little or no discrimination against Hong Kong residents. Children (or other family members) studying abroad also serve as valuable information sources. Thirdly, political stability is another factor of concern, and here English-speaking democracies, particularly those with growth potential, are seen as superior locations. Canada, the United States, and Australia are attractive for this reason.

This chapter tried to provide some background information regarding recent Chinese emigration to Canada. It has shown, by a conservative estimation, that Chinese immigrants from six major sources—Hong Kong, China, Taiwan, Singapore, Brunei and Malaysia—amounted to 143,152 between 1985 and 1990. This flow accounted for 15.8% of total immigrants who arrived in Canada during that period. Nearly three quarters of the Chinese immigrants were independent immigrants, compared to less than a half of the total immigrants to Canada. Chinese were especially over-represented in the classes of "Entrepreneur" and "Investor." Chinese immigrants were also relatively young and better educated than the general population of Canada. The recent inflow of Chinese emigrants has attracted significant attention among the Canadian public. Discussions are mostly focused

[1]The term overseas Chinese refers broadly to Chinese living outside of Mainland China.

on the large volume of business immigrants, the economic impact of the new immigration programs, the exact amount of money the business immigrants has invested in Canada and the number of jobs they have created. The questions are asked whether immigrants create employment or take jobs away from Canadians, if the Chinese are responsible for the rapid rise in Toronto and Vancouver home prices, and if Canada is selling citizenship to the rich Chinese who have no intention of living in Canada (Cannon 1989; Malarek 1987; Nash 1987). This chapter does not intend to review those discussions for they are beyond the scope of this study. It does, however, intend to demonstrate the importance of Chinese in the overall flow of immigrants to Canada in recent years and therefore justify the choice of Chinese immigrants as the subject of this study. The reasons for emigration and choosing Canada as the destination and their information search patterns revealed from this brief review will be used to compare with the survey findings of this research.

Chapter 5

Survey and questionnaire design

To test a new idea or model through objective procedures is an indispensable part in any behavioral research. In this study, a sample survey of recent Chinese immigrants to Canada was conducted in order to collect first hand information from real immigrants to verify the migration decision-making model to be developed in later chapters of the dissertation. This chapter is concerned with the design and procedures of the survey, the design of survey questionnaire, and the control of responses.

5.1. Survey design

5.1.1. Purpose of the survey

There are two purposes of this survey:

The first is to test the validity of a migration decision-making model, which prescribes the way people acquire and process information and assess risky properties associated with alternative migration destinations. It is fundamentally believed in behavioral research that any theoretical model is subject to empirical test. When any inconsistency between a model and people's actual behavior is detected, a modification will be made to the model to make it a more accurate description of the behavioral pattern of people in the real world.

Secondly, Chinese immigrants from various Asian countries and regions, especially from Hong Kong constitute one of the largest immigrant groups to Canada in recent years. They are making a significant impact on today's Canadian economy and society. This survey attempts to help enhance our general understanding of this group of people in terms of who they are, why and how they chose to emigrate to Canada. It will, hopefully, help to draw concrete implications for policy

formulations.

5.1.2. Sampling

Survey population The survey population of this research includes those, who are of Chinese origin and who settled in Edmonton, Alberta, Canada between 1985 and 1990 as independent immigrants. The class of independent immigrants, according to Canadian immigration laws and regulations, is further subdivided into Retirees, Assisted Relatives, Business Immigrants (Entrepreneurs, Self-Employed Persons and Investors), and Other Independent Immigrants. It is assumed that people falling into these classes are relatively independent in making their decisions to migrate to Canada and therefore, suitable for the purpose of this survey.

As was estimated in Chapter 4, the total number of Chinese independent immigrants who arrived in Alberta between 1985 and 1990 was 10,559. The sources of Chinese immigrants include Brunei, China, Hong Kong, Malaysia, Singapore, and Taiwan. There is a lack of specific information regarding the proportions of immigrants from those sources who have settled in Edmonton. According to the Alberta Career Development and Employment (ACDE 1990a; ACDE 1990b), 45.2% of the total Hong Kong immigrants who arrived in Alberta between 1985 and 1989 have settled in Edmonton . If the same proportion is used to estimate the total independent Chinese immigrants who settled in Edmonton between 1985 and 1990, the survey population of this study is 4,773 (10,559 $\times$ 45.2%).

Admittedly there are several problems about the survey population. First, most of the questions in the questionnaire were concerned with reasons for moving, choosing and comparing alternative destinations, and information-searching behavior prior to the respondents coming to Canada. As was pointed out by several authors (De Jong and Fawcett 1981; Winchie and Carment 1989), statements on reasons for moving might reflect pre-move motivations, but they might also be post-hoc reflections of immigrants about their previous behavior. Since it is impossible to survey any group of potential migrants before migration occurs, this study tries to work with the best population that is available. The survey population was restricted to more recent immigrants to minimize the inaccuracy of the responses resulting from memory problems. Besides, several statistical tests were used to check the consistency of responses. These efforts should alleviate some of the methodological inadequacies of the approach of pre-move decision-making behavior. Second, sampling bias may occur due to the exclusion of those who have not successfully migrated to Canada. It is possible that there existed certain differences in the way motivations for and constraints of migration were experienced, and decision strategies and information search patterns were employed, between those who successfully migrated and those who did not. Unfortunately, there is

not much can be done about it at this time. However, a comparative study of the decision-making behavior between movers and non-movers might be set as a topic for future studies. In spite of the above deficiencies, there are reasons to believe that the survey population is still valid for the purposes of this study.

Sampling frame: Chinese surnames that appeared on the *1991 White Pages* of the Edmonton telephone directory constituted the sampling frame. It was assumed that qualified survey population would be found by making telephone calls to people on that list. This is actually neither a complete nor exclusive list of Chinese in Edmonton. The main reasons include: (1) Not all Chinese use typical Chinese surnames. Some of them choose to use English names that are close to their Chinese names in pronunciation. These people were missing from the sampling frame. (2) Some Chinese names are identical to English names, such as Lee, Long, Shaw. In this case, only those whose Chinese given names could be identified were included. (3) Some Chinese surnames as well as given names are similar or identical to Vietnamese, Korean, or Laotian names. In this case, they were first included in the sampling frame but those that were found to be non-Chinese at the telephone contacts were deleted afterwards. Finally, those Chinese immigrants whose names did not appear on the telephone directory were not included in the sampling frame.

Sampling size: Sampling size is an important issue in most survey research. Too big a sample will make the survey too expensive and difficult to manage, while too small a sample will not ensure the accuracy of the survey data. Three factors—*homogeneity of the population, degree of accuracy,* and *level of confidence* required by the study to determine the appropriate size of a sample. Various methods have been suggested how to choose an appropriate sample size (Stoddard 1982; Gardner 1978; Dixon and Leach 1976). This study adopts the solution suggested by Dixon and Leach (1976), *i.e.,* to look for an approximation to the desired sample size from a table, as is shown in Table 5.1. Table 5.1 gives the sample size needed to estimate population values to within a chosen percentage (the precision limit) with a desired probability of being right (the confidence level) assuming the variability of the population is 50 per cent. For a proportion, this is the maximum possible variability, and the table therefore gives a conservative estimate of sample size. According to Table 5.1, and assuming a confidence limit of 5% at the 95% confidence level is required (which is most commonly used in social survey), the estimated sample size of the current study should be 384. Therefore, the next step of the survey is to obtain 384 qualified immigrants from the sampling frame, who would also be willing to participate in the survey.

Table 5.1: Sample sizes needed to estimate population values with given levels of confidence, assuming a variability of 50% and a very large population

Precision limit (±%)	Confidence level 99%	95%
1	16587	9604
2	4147	2401
3	1843	1067
4	1037	600
5	663	384
6	461	267
7	339	196
8	259	150
9	205	119
10	166	96
15	74	43
20	41	24

(Source: Dixon and Leach 1976)

Sampling and methods of conducting the survey: The purpose of the sampling was to obtain a list of names to whom telephone calls would be made to find out whether they were of Chinese origin and migrated to Canada between 1985 and 1990 as independent immigrants, and whether they would like to participate in the survey. The aim was to obtain a minimum of 384 such participants and then a self-administered questionnaire would be mailed to each of them for completion.

A survey was conducted in Edmonton between August and December 1991. The approximate size of the sampling frame was around 6,000, which included the target population as well as some of those who did not fit in, such as immigrants of the Family or Refugee class, who came to Canada before 1985, or who were Canadian (by birth) of Chinese ancestry. Telephone calls were made to every 5th family on the frame (with a random start) to obtain addresses of those who qualified and agreed to participate in the survey. After the addresses were obtained, a questionnaire was sent to each of them on the following day. Included with the questionnaire was a self-addressed business reply envelope and a letter (*Appendix F*) acknowledging the recipients' participation in the survey, explaining the purpose of the research, and reassuring them about the confidentiality and anonymity of the survey. The questionnaire and covering letter were printed in both English and Chinese. Either English or Chinese was used in the telephone conversation according to the preference of the respondent. After the first round of systematic sampling of the frame, the sample size was found too small to be

satisfactory. Therefore, more phone calls were made, to all families that were left on the sampling frame and whose names were not listed on the *1985 White Pages* of the Edmonton telephone directory. It is reasonable to assume that these families were more likely to have qualified immigrants who came to Canada after 1985. Telephone calls were made between August 7 and November 15, 1991. A copy of the introduction to the telephone survey is included in *Appendix C* of the dissertation. A total of 392 potential respondents were identified and the same number of questionnaires were sent to them over the three odd months period. Compared to the rough estimate of the survey population of 4,773 made earlier, this list made up 8.2% of the total survey population. Three weeks after the questionnaires were sent, a follow-up letter (*Appendix G*) was sent to each of the initial members of the sample, thanking those who might have already participated and encouraging those who had not to do so. No follow-up letters were sent to those who requested a summary report of this survey, since they were known to have returned their questionnaires and their efforts would be thanked when they received a copy of the survey report. Two questionnaires were returned undelivered. By December 13 1991, 192 returned questionnaires had been received. The response rate was 49.23%. As is observed, not all the 392 potential respondents returned their questionnaires as they promised; the sample size finally obtained was not big enough to meet the precision limit previously set, keeping the confidence level unchanged. However, it was accepted as satisfactory, for it was still a relatively large sample compared with most process-tracing studies of human decision-making behavior (Montgomery and Svenson 1989; Bronner and De Hoog; Tyszka 1989).

Pre-test of survey questionnaire

The purpose of the pre-test of survey questionnaire was to check the suitability of the wording and the range of answers provided in the questionnaire. Fifteen questionnaires were distributed among colleagues, friends and acquaintances in an informal fashion in Edmonton who recently came from other countries. Certain adjustment was made to the questionnaire after the pre-test, and it resulted in the form as is shown in *Appendix D*.

5.1.3. Measuring instrument—the questionnaire

The survey questionnaire was mainly designed to test hypotheses associated with decision-making strategies and evaluation of risky properties in migration. The theoretical bases on which the hypotheses were formulated were the model of search for a dominance structure and prospect theory. At the same time, the questionnaire also aimed to obtain information from Chinese immigrants about

their specific motivations for migration, constraints of emigration they had encountered, and their major sources of information relating to their moving to Canada. The questionnaire consists of four parts. Both an earlier version (*Appendix D*) and a modified version (*Appendix E*) were used in the survey. Most questions in the earlier version of the questionnaire remained unchanged in the modified version except that Questions 8–12 in the earlier version were replaced by Question 8 in the modified version. Therefore, the earlier version consisted of 22 questions while the modified version consisted of 18 questions. The reason for changing those questions in the questionnaire is given in the following description of the questionnaire design, where reference is made to numbers in the earlier version of the questionnaire.

(Part I) Questions about migration motivation.
This part consisted of three questions. Questions 1 and 2 were designed to find out the motivations behind people's decision to migrate to Canada. Migration motivations are believed to be related not only to the decision of whether to move or not, but also where to move. It was expected to learn from the survey that different strengths of motivations might lead to different decision strategies being adopted. The reasons and goals specified in the two questions were based on the seven conceptual categories that represented psychologically meaningful clusters proposed by De Jong and Fawcett (1981), adjusted to the existing empirical findings of recent Chinese emigrants to Canada. The variables examined in the survey under the seven categories included:

Wealth: good income, high standard of living;

Status: prestigious job, advancement in job, better education, honor of family, being looked up to in community;

Comfort: comfortable housing, easy and comfortable life, more leisure time, good weather;

Stimulation: desire for adventure or different lifestyle and cultural environment, doing new things;

Autonomy: political stability and freedom, being free to say and do what you want;

Affiliation: join family, near friends or relatives;

Morality: better education for children.

Question 3 was about constraints of emigration. Previous studies suggested that a key factor in understanding migration decision process was the specification

of constraints, since objective features of the environment might restrict the role of subjective preferences in spatial behavior (Fawcett 1986; Simmons 1986). In international migration, immigration policies of receiving countries, financial cost of moving and starting up in a new environment afterwards, and psychological cost stemmed from leaving family and friends and uncertainty about the future are most likely to affect people's decision to migrate, and to restrict them to very few alternative destinations. Those were the variables regarding constraints of emigration examined in the survey.

(Part II) Questions about making a choice out of several alternatives. Questions in this part were directly related to the test of the model of search for a dominance structure in migration and prospect theory in describing the way people evaluate risky properties in alternative migration destinations. Questions 4 and 5 were designed to find out what alternatives the immigrants had considered before they made their choice on Canada, or whether they had considered other alternatives at all. The countries listed were believed to be those most frequently considered by Chinese immigrants as migration alternatives.

Questions 6 and 7 were designed to find out to what extent each of the decision rules listed in Table 1.1 had correctly described the immigrants' information processing behavior.

Questions 8 to 12 were directed to find out how people had evaluated conditions in alternative countries that were presumably important to them in choosing a migration destination, and how they made their choices while they were not completely certain about those conditions. In other words, these questions were directed to find out to what extent Figure 8.2 had reflected choice behaviors under risk in the real world.

After the first 237 survey questionnaires were sent out, about 40 people among others, who had returned their questionnaires responded to questions 8 to 12. One problem observed from the responses was that most people tried to avoid making judgments under extreme probabilities, such as "extremely unlikely," "somewhat doubtful," and "definitely sure." This would cause problems in verifying prospect theory, which is an important goal of this study. Therefore, a modification of the questions was made to the remaining 155 questionnaires. This time, numerical numbers rather than probability phrases were used. The respondents were also asked to make a decision under several specified conditions, some of which might be hypothetical to them. The new question was Question 8 on the modified version of the questionnaire (*Appendix E,* which replaced Questions 8–12 on the earlier version of the questionnaire shown in *Appendix D*). The returned questionnaire showed, among the 237 who had received the earlier version of the questionnaire, 103 returned their completed questionnaires, but only 45 answered Questions 8–12. Among the 155 who had received the modified version, 89 returned their

completed questionnaires and 85 of them answered Question 8. Question 8 of the modified version drew a much lower "item nonresponse rate" (Lessler and Kalsbeek 1992), than Questions 8 to 12 of the original version did, indicating that the modified version was simpler and easier to answer.

Question 13 was concerned with the specific reasons for migrating to Canada instead of other countries. Special features of Canada, such as multiculturalism and immigration policy were added to the list compared with Questions 1 and 2. It also served to check the consistency of answers to both questions about motivation for and constraints of migration.

(Part III) Questions about information search behavior.
Question 14 was about the length of time between the first thought of leaving the original countries or regions and the actual decision on migrating to Canada. Brown and Moore (1970) have suggested that time has an effect upon the choice of information channels and the intensity with which they are used. Question 14 was designed specifically to examine the effect of time on the way information was acquired and the decision strategy followed. However, it was later found out from the returned questionnaires that this question had the lowest response rate, probably because it was not very clearly stated. Still some respondents misunderstood the question by giving the year and month in which they submitted their immigration applications. Therefore, this question was excluded from the data analysis.

Questions 15 and 16 were about the sources and content of information. Reasons for the inclusion of those questions were mainly practical—to understand from which sources people obtained information and what they were mostly concerned about with regard to migrating to a new country. The sources of information included informal sources such as family and friends, and formal sources such as government agencies and media. Family and friends at potential destinations are believed to have significant influence on the decision to move and particularly on the decision where to move, because they create awareness of conditions and opportunities in the destination and offer assistance to relocate potential migrants (Ritchey 1976). Nine types of information were specified in Question 16, covering the social, economic, educational and racial aspects of potential destinations. The number of sources and types of information searched was important in differentiating a vigilance information process from a nonvigilance one.

Question 17 was about the way information was acquired and processed. It could also be used as a check to the questions about decision rules, since there is a central assumption underlying most process-oriented research on decision-making that the way information is acquired indicates which decision rules are used (Sundstroem 1987).

(Part IV) Personal information about respondent.
Questions in this part included length of residence in Canada, marital status, age, gender, and class of immigration of the respondents. These questions were designed to examine how the personal factors affect the way decision strategies were adopted and information searched.

Questions 1, 2, 6, and 7 were designed on a five-point format (from "of no importance" to "of great importance" and from "strongly disagree" to "strongly agree"), rather than a two-point format. The reason is that a five-point format would allow respondents to express their perceptions or opinions more precisely and it makes clearer the differences among items of reasons, goals, or decision rules from the perspective of the respondents. Furthermore, since people are a little afraid of using the extreme categories—a phenomenon known as the error of central tendency—the options (such as "agree" and "disagree") may appear milder pro or con in a five-point context than in a two-point context. Therefore, it makes the extreme categories sound less extreme and in turn encourages their use (Oppenheim 1966; Molenaar 1982).

Questions 3–5, 13, and 15–17 were presented as closed questions, or checklist-questions. A limited set of alternatives are supplied in this type of questions, out of which the respondents will have to choose one or more. An alternative to this design is to use open questions, with which such a previously given set is not supplied. Closed questions, or checklist-questions as distinct from open questions seem to help or to guide respondents in their search for an answer, especially when the opinions are not well crystallized: some of the supplied answer categories may put forward things that otherwise (*i.e.* in open questions) would not have been thought of (Molenaar 1982). Since questions in this survey were concerned with retrospective feelings, opinions or facts, a hint in the answers would be helpful to respondents whose memories of the major constraints of emigration they had encountered or the kinds of information regarding migration they had acquired, for instance, might have faded in the past few years. That especially made the closed format a better choice than the open one in this study. The problem with the guiding nature of closed questions seems to consist partly in drawing attention to certain things, and in suggesting answers ("putting words into the mouth") (Molenaar 1982:56). However, the problem can be minimized if the provided set of answer categories is complete and a rest-category "other ..." is added, as was done in this study. A laboratory experiment carried out by Dohrenwend (1965; Molenaar 1982) concluded that the usefulness of the replies to open and to closed questions was not significantly different; the pertinence of the replies appeared to be somewhat higher in closed questions as to one's own feelings, motives (such as Questions 3 and 13), as compared to those in open questions. The validity of the replies to factual questions (such as Questions 4, 5, and 15–17) was alike, while open questions did not yield more "depth"—information than closed ones.

Taking all evidence into account, as pointed out by Dohrenwend (1965), the use of well-tested closed questions would be more advantageous to the investigator than open questions.

Another potential problem associated with closed questions is that answers may be affected by the order in which the alternatives happen to be mentioned. Such order-effect may consist of a preference for the earlier mentioned alternatives, called "primacy"-effect, or of a preference for the later mentioned alternatives, called "recency"-effect (Molenaar 1982). As pointed out by Molenaar, order-effects tend to occur when the item-list is long. The longest list in this survey questionnaire consisted of ten items plus two others that were easily distinguished from the rest (Question 13). It was still considered as manageable, since according to Miller (1956) and Hulbert (1975), respondents are able to handle "seven plus or minus two" categories of information. Therefore, order-effect would not be a problem in this questionnaire design.

The third concern regarding closed questions is the potential effect of the number of answer-categories on the respondents' choices. Studies have shown (*e.g.*, Lindzey and Guest 1951) that varying the number of answer-categories is not always simply lowering or raising an integer, it often entails changing one or more of the basic properties of the scale concerned, especially when the categories are verbally labeled. But if the list of answer-categories is complete, in other words, no important items are omitted and the number of categories is within the "seven plus or minus two" limit among which humans are capable of discriminating, a good measure can still be assured. An effort was made with respect to all the closed questions in this questionnaire to ensure that the categories were complete and manageable.

Questions 18–22 were also checklist-questions. They were crystallized personal questions so the potential problems discussed above were not likely to happen to them. The format of Questions 8–12 were determined by the hypotheses (regarding prospect theory) they were meant to test. There was no other alternative that could be used to achieve the same purpose.

5.2. The validity and reliability of the responses

The survey questionnaire was designed to provide both factual information and opinions, of which the latter accounted for a bigger part. Furthermore, most of the questions were concerned with the decision-making process that might date back several years through which the immigrants reached their decisions to come to Canada. Therefore, it raises the question of the validity and reliability of the responses since "people's memories get blurred with the progression of time" (Golledge and Stimson 1987:257). Here, validity refers to the truthfulness of an

answer while reliability refers to the consistency of answers to the same type of questions. Validity and reliability studies are found in psychological literatures (*e.g.,* Henerson et al. 1978; Oppenheim 1966; Patchen 1965), which exclusively focus on the measurement instrument. They deal with such questions as "Is the instrument an appropriate one for what needs to be measured?" and "Does the instrument yield consistent results?" In this case, however, the concern is with the responses. The same terms and ideas as those in the psychological literatures will still be used, only in this time they are applied to response items. The main factors that affect the truthfulness of a response include, as identified by Henerson et al., response bias due to desire to please if the respondents perceive certain answers as socially desirable, or lack of comprehension or self-awareness, which means when people do not understand the questions, they cannot respond accurately. In this survey questionnaire, most questions were concerned with the reasons why the immigrants wanted to leave their original countries to come to Canada, how they thought about alternative migration destinations and the way they searched for information about the alternative destinations. Since they were not concerned much with social norms, the first factor was minimized. The simplicity and clarity of the questions were tested at a pre-test of the questionnaire and improvements were made to the greatest extent possible. Therefore, the second factor was also minimized (except Question 14, which was excluded from the data analysis). As was pointed out by Cozby (1989), if the researcher openly and honestly communicates the purposes and uses of the research, promises that there will be feedback about the results, and assures anonymity, then there is every reason to believe that subjects will provide honest responses. The major concern here, however, is the "post hoc reflections of migrants about their prior behavior" (De Jong and Fawcett 1981). There is not much that can be done about it since there is no established method for determining validity (Henerson et al. 1978). An effort will be made to compare findings of this study to other relevant studies, known as cross-checks (Oppenheim 1966), to see whether they agree with, and therefore validate each other. With regard to the reliability, or consistency of the responses, the current study has employed two nonparametric measures of correlation, namely the **Spearman Rank Correlation Coefficient** (r_s) and the **Chi-square test** (χ^2) to check the reliability of the responses to the questions. In using those statistical measures, the author relied on Siegel (1956:104-111;175-179;202-213) and Ebdon (1985:97-101). The statistical tests were conducted for two types of relationships: (1) the correlations among items that intend to reflect the same characteristic (or opinion) given by each individual respondent, and (2) the correlations among respondents who gave answers to the same items by their periods of immigration to Canada.

The next two sections discuss respectively, by using the Spearman rank correlation coefficient and the χ^2 test, the reliability of the responses for the above

mentioned two types of relationships.

5.2.1. Correlation among items, by individual responses

In the first stage correlation among items intended to reflect the same characteristic given by each individual respondent was examined. It is assumed that high intercorrelations are an indication of the reliability of an answer when the logic of the construct calls for high correlations (Patchen 1965). If a person's memory has failed, it is very likely that his/her answers to the same type of questions are not consistent. On the other hand, if a person's answers to the same type of questions are consistent or highly related, then there is no reason to doubt his/her memory and the answers are to be considered reliable. Questions 1 and 2 which were both concerned with motivations of migration had an inherent relationship. Theoretically, Question 13 which was concerned with the specific reasons for choosing Canada instead of other countries should also be related to motivations of migration. However, the intensity of the relationship was reduced due to the constraints of international migration. Many factors affect and determine the possibility of migrating to another country and those factors are usually beyond the control of the immigrants. A study on the returned pre-test questionnaires also indicated that it was difficult to obtain an association between the specific reasons for migrating to Canada and the more general motivations of migration to satisfy any statistical test at the .05 level. Therefore, Question 13 was not tested together with Questions 1 and 2. Questions 1 and 2 were designed on a closed-format and scores of importance (from 1 to 5) assigned to each of the items could be viewed as ordinal data. Therefore, the Spearman rank correlation coefficient is appropriate for the test of correlations among items for each individual response. For the sake of simplicity and efficiency, the motivations listed in Questions 1 and 2 were regrouped into five categories and the item "Unpleasant climate" of Question 1 that did not fit into any of the five categories was not counted. Table 5.2 shows an example of testing the correlations among responses to Questions 1 and 2[1]. The ranks entered into Table 5.2 are scores drawn from one of the returned questionnaires.

The value of the rank correlation coefficient can be calculated:

$$r_s = 1 - \frac{6\sum d^2}{n^3 - n} = 1 - \frac{6 \times 6}{5^3 - 5} = 0.70$$

[1]The minimum number of subjects N in the Spearman rank correlation coefficient test is 4, according to Siegel (1956) or 5, according to Toothaker (1986). Therefore, $N = 5$ in this case is valid.

Table 5.2: Ranks on "Motivations of Migration" from Questions 1 and 2

Motivations	Rank		d_i	d_i^2
	Question 1	Question 2		
Living Standard and income	1	1	0	0
Occupation & Education	3	2	1	1
New Environment	1	3	-2	4
Family reason	5	5	0	0
Political reason	4	3	1	1
				$\sum d_i^2 = 6$

The result showed that there was a relatively high degree of positive correlation ($r_s = .70$) between corresponding items in Question 1 and Question 2 for this particular respondent. A coefficient of $r_s = .70$ was considered as the minimum acceptable value for the reliability of responses to Questions 1 and 2 in this study. Therefore, the above returned questionnaire is reliable judging by its answers to the first two questions.

Questions 6, 7, and 17 were concerned with decision rules and information search patterns. It is believed that the way information is acquired indicates which decision rules are used (Sundstroem 1987). More specifically, intra-alternative search corresponds to conjunctive (CON), addition of utilities (AU), and disjunctive (DIS) rules while intra-attribute search corresponds to elimination by aspects (EBA), lexicographic (LEX), maximizing number of attributes with a greater attractiveness (MNA), and dominance (DOM) rules. One search process allows one or more than one decision rules to be involved. Therefore, if intra-alternative search was checked in Question 17 and any of its corresponding rules was scored higher than "Neutral" in Questions 6 or 7, the response was considered as reliable. On the other hand, if intra-attribute search was checked in Question 17 and any of its corresponding rules was scored higher than "Neutral" in Questions 6 or 7, the response was considered as reliable, too. Since checking out the consistency of these three questions is a simple matter, no statistical test was needed. The test was done visually.

The study of correlations among items for each individual response actually serves as a quality control of the returned questionnaires. If a questionnaire fails to show a reasonably high intercorrelation among related items, it will be considered as unreliable and thus be excluded from any further data analyses. In this study, all the 192 returned questionnaires have been checked in this way and 187 passed the test. Among the five questionnaires that have failed, three were completed by immigrants of Family class. Too many questions on the questionnaire were left unanswered because they were not applicable to their cases. Two questionnaires failed at the Spearman rank correlation coefficient test on the first two questions.

No questionnaires were disqualified at the visual check of consistency between Questions 6 and 7 and Question 17. As a result, the data on which the remaining part of the dissertation is based are drawn from the 187 qualified questionnaires.

One question might arise with regard to this method is that an observed low Spearman rank correlation coefficient among supposedly correlated items might be a result of inappropriately worded or grouped question items, instead of any fault of the respondents. Since a pre-test of the questionnaire has been conducted and both the contents and wording of all questions have been revised accordingly, this problem is assumed to be minor.

5.2.2. Correlation among respondents, by periods of immigration to Canada

It is assumed that time is the most significant contributor to people's "memory lapse" or "post hoc reflections about prior behavior" should any of these problems exist in the returned questionnaires. People who have been living in Canada for a longer time presumably have more trouble recalling their thoughts prior to coming to Canada, and their judgements about Canada and their original countries are more likely to be affected by their experiences in Canada in the past years than the newer immigrants. This time, a χ^2 test would be helpful to show if there is any significant difference among immigrants of different time periods in their answers to the same questions. On the survey questionnaire, one question was asked about the year the respondent migrated to Canada. The respondents were thus grouped into three categories according to their period of immigration: 1985–1986, 1987–1988, 1989–1991. Questions 1–3, 6–11, 13 and 15–17 were tested by this method, respectively. If no difference observed between scores given by immigrants of the three time periods was statistically significant, the responses from immigrants of all periods were then considered as reliable. Table 5.3 shows how responses to reasons for emigration given by immigrants of three time periods were tested. Items of reasons from Question 1 of the questionnaire were grouped into five categories, where I was about living standard, including the first three items, II was about occupation and education, including the 4th to the 7th item, III was about new life style, corresponding to the 9th item, IV was about family ties, corresponding to the 10th item, and V was about political reasons, corresponding to the 11th item. The null hypothesis was that the immigrants of three time periods had the same scoring pattern towards reasons for emigration.

$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 6.42$

Significance level: let $\alpha = 0.05$,

$df = (k-1)(r-1) = (3-1)(5-1) = 8$

Table 5.3: Scores given to reasons for emigration, by period of immigration

Period of	Reasons for emigration										Total
	I		II		III		IV		V		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	232.2	256	196.8	193	61.3	52	60.9	60	113.7	104	665
1987-88	650.5	643	551.5	552	171.8	168	170.6	172	318.6	328	1863
1989-91	787.3	771	667.6	671	207.9	221	206.5	206	385.7	386	2255
Total		1670		1416		441		438		818	4783

Reference to *Appendix A* reveals that a value of 6.42 is smaller than 15.51, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, the decision is not to reject H_0. It was concluded that there was no significant difference among immigrants of three time periods in the way they evaluated the importance of various reasons for emigration.

Questions 2–3, 6–11, 13 and 15–17 were tested in a similar way. The procedures and results are shown in *Appendix H*. As in the test of Question 1, no significant difference among immigrants of three time periods had been observed in the responses to any of the questions. Therefore, questionnaires returned from immigrants of all time periods were considered to be reliable, as long as they passed the Spearman rank correlation coefficient test on the individual questionnaires.

Statistical analyses of the survey data were carried out by using database and worksheet programs in *Microsoft Excel* on Macintosh computers.

5.3. Survey result on demographic composition of respondents

Among the 187 immigrants whose returned questionnaires were qualified for data analyses, males accounted for 60.3% while females accounted for 39.7%. The distributions of age and marital status are as shown in Table 5.4 and Table 5.5, respectively. The majority of the respondents were between 20 and 50 years of age (account for 85.0% of total respondents) and were married (account for 82.3% of total respondents).

The next three tables show the distributions of respondents by their last permanent residence (Table 5.6), class of immigration (Table 5.7) and period of immigration (Table 5.8). Hong Kong immigrants accounted for nearly two thirds of the total respondents, while the number of immigrants from Brunei and China

Table 5.4: Age distribution of respondents

Age group	Number	% as total
≤ 19	3	1.6
20-35	79	42.3
36-50	80	42.8
≥ 50	25	13.4
Total	187	100.0

Table 5.5: Distribution of marital status of respondents

Marital status	Number	% as total
Never married	27	14.5
Married	153	82.3
Separated, divorced, widowed	6	3.2
Total	186	100.0

ranked second and third, respectively. Besides Taiwan, Malaysia and Singapore, the "Other" source countries included the Philippines, Vietnam, U.K., U.S., and Panama. Over half of the respondents belonged to the class of "Other independent immigrants." This group includes workers selected to fill jobs needed in the labour market, those coming to Canada with jobs, professions or skills to contribute to Canada's economy and those applying as independent immigrants for other reasons (Employment and Immigration Canada 1987). In this study, "retirees" were also grouped into this class. "Investors," "Entrepreneurs" and "Self-employed immigrants" together account for 18.3% of the total respondents. These classes of immigrants are believed to have brought the most money and created most jobs in Canada. Among the entrepreneurs and self-employed immigrants, 18 were from Hong Kong, 3 from Brunei, 3 from Taiwan, 1 from Malaysia, and 2 from other sources. There were 19 males and 8 females in this group, and they appeared in every age group. All 7 investors were from Hong Kong. Five of them were male, 2 were female. They concentrated in the age group of 36-50 and 50 or more years of age. All of them were married. Among relatives, 27 were from Hong Kong, 13 from China, 4 from Brunei, 3 from Malaysia, 2 from Taiwan, 1 from Singapore, 1 did not identify his origin, and 6 from other sources. Twenty-seven of them were female and 30 were male. In the other independent immigrants group, 66 were from Hong Kong, 15 from Brunei, 5 from China, 2 from Malaysia, 2 from Singapore, 1 from Taiwan, 1 from other sources, and 3 did not identify their origins. Thirty-six of them were female and 59 were male. With regard to the period of immigration, the table shows an increase in numbers of respondents over the years. Over 87% of the respondents came to Canada within the last four years.

The lower response rate from earlier immigrants may also due to the fact that some of them had participated in previous surveys of Chinese immigrants, such as the one organized by Alberta Career Development and Employment conducted in 1990, and therefore felt reluctant to participate in another survey.

Table 5.6: Respondents by last permanent residence

Last residence	Number	% of total
Hong Kong	119	65.0
Brunei	22	12.0
P.R. China	18	9.8
Taiwan	6	3.3
Malaysia	6	3.3
Singapore	3	1.6
Others	9	4.9
Total	183	100.0

Table 5.7: Respondents by class of immigration

Class	Number	% of total
Entrepreneurs & Self-employed	27	14.5
Investor	7	3.8
Assisted relatives	57	30.6
Other independents	95	51.1
Total	186	100.0

Table 5.8: Respondents by period of immigration

Period of immigration	Number	% of total
1985-86	24	12.9
1987-88	73	39.3
1989-90	89	47.9
Total	186	100.0

This chapter explained the design of the survey in terms of the purposes of the survey, the target population, sampling frame, sampling size and methods of conducting the survey. It also explained the design of the questionnaire and introduced methods of controlling the consistency of responses. Finally, it presented the social demographic composition of the survey participants. Compared to the composition of total Chinese independent immigrants who arrived in Canada and

Alberta (Table 5.9), this sample by and large represents the general survey population. For example, Hong Kong immigrants dominate the sample, followed by immigrants from Brunei and China. "Other independent immigrants" account for the largest proportion of the sample while "investors" have the smallest proportion. The number of immigrants in the sample increases over the years. All these features of the sample are true for the general population of Chinese immigrants. Therefore, the conclusion is that the survey sample properly represents the target population of this study.

Table 5.9: Composition of immigrants (%)

By country of last permanent residence		
Country	Total to Alberta	Sample
Hong Kong	67.9	65.0
China	20.2	9.8
Brunei	3.3	12.0
Singapore	3.4	1.6
Taiwan	3.2	3.3
Malaysia	2.0	3.3
By class of immigration		
Class	Total to Canada	Sample
Other independents	60.0	51.1
Entrep. & self-employed	25.5	14.5
Assisted relatives	8.6	30.6
Investor	6.0	3.8

Chapter 6

Appraising the challenge: the beginning of a migration decision process

Most analyses of individual decision-making in migration distinguish between two major phases in the decision-making process—the decision to seek a new residential site and the relocation decision. This chapter deals mainly with the first phase and leaves the second one to the next two chapters. More specifically, it will, on the one hand, address issues such as how a decision problem has arisen for potential migrants, the kind of stress situation they have perceived, and the kind of goals they have expected to achieve through migration, by presenting survey findings of the recent Chinese immigrants. On the other hand, it will provide a background for the study of the relationship between stresses and motivations and how they affect the way people process information and make choices. At the end of this study, an attempt will be made to establish propositions that link together the motivations of migration and the decision-making as well as information search behavior of a potential migrant.

6.1. The beginning of a migration decision-making process

Migration is generally viewed by most geographical and psychological studies as a process of adjustment whereby one location is substituted for another in order to better satisfy the needs and aspirations of each migrant (Brown and Sanders 1981). The individual's overall level of satisfaction or dissatisfaction with respect to a given location is described in terms of place utility (Wolpert 1965; Pryor 1976; Brown and Sanders 1981; Haberkorn 1981).

Place utility is normally used in reference to neighborhood evaluations. In this study, the concept is applied at a larger scale, which is in the context of international migration. It is based on the assumption that people evaluate the country they live in and countries they might want to live in a similar way as they evaluate their neighborhoods. The only difference is that the criteria involved in the evaluation in the earlier case are associated with countries, rather than neighborhoods. In other words, international migration may occur when an individual is not satisfied with the general condition of his/her home country even though he/she might be satisfied with the neighborhood.

Two types of factors will induce the decision to seek a new location. The first one, suggested by Brown and Sanders sees the decision on seeking a new location as a result of a long term, continuous evaluation of the congruence between the individual's needs or expectations and the offerings associated with the present residence. The disparities between needs or expectations and environmental offerings give rise to stress, which in turn may lead to the decision to seek a new residence.

The other source that induces decision on seeking a new location is obtained from Janis five-stage schema of human decision-making. Rather than viewing the beginning of a decision-making process as the result of a long term evaluation, the theory emphasizes the role of a specific event or information that calls the individual's attention. More specifically, "being exposed to information about a threat or opportunity that effectively challenges a current course of action marks the beginning of the decision-making process" (Janis and Mann 1977:172).

By analyzing the data obtained from the survey, it will show that both types of sources have worked in triggering the decision-making processes of the Chinese immigrants under study.

6.2. What was so stressful at home?

In order to find out what were the main factors that drove the Chinese away from their original countries, or what were the sources of stress people suffered before they made up their minds to leave their home countries, several questions were asked in the first section of the survey questionnaire under the heading "Questions about Migration Motivation" (*Appendix D*). The first one was about the importance of various reasons that had made people leave their home countries. The reasons were assessed in a closed-format question, where scores from 1 to 5 were assigned to represent an ascending order of importance from "of no importance" to "of great importance" of the reasons. Table 6.1 gives the total and average scores received by each reason, along with the total number of responses to each of them. The higher the average score, the greater the reason had contributed to people's decision to leave their original countries.

Table 6.1: Score of importance by reason for emigration

Reason	Total score	Number of responses	Average score
Crowded living conditions	453	185	2.4
Inadequate housing	407	185	2.2
Inadequate income	368	185	2.0
Inadequate educational facilities for self	460	185	2.5
Inadequate educational facilities for children	650	185	3.5
Lack of suitable employment	367	185	2.0
Lack of opportunity for advancement in job	412	185	2.2
Unpleasant climate	350	185	1.9
Desire for adventure or different life/culture	444	185	2.4
Close relatives or friends all going abroad	439	185	2.4
Political stability and freedom	823	185	4.4
Others		15	

As is shown in the table, "political stability and freedom" topped the importance of reasons for emigration. The average score given to this item was 4.4, which was very close to the score of "of great importance."

Looking at the average scores given by Chinese immigrants of different origins as is shown in Table 6.2, immigrants from Hong Kong, Brunei and China ranked political reason the highest among all reasons for emigration. Their scores for political reason were also higher than the rest of the immigrant groups. It is not difficult to figure out that the return of Hong Kong to the Communist China in 1997 was the main concern of the Hong Kong immigrants. Quite a few respondents also wrote such comments on their questionnaires as: "I would never have thought of leaving Hong Kong if it had not been for 1997," and "The moment I

decided to apply for immigration, I knew I lost everything. But I had to leave because of 1997." The political pressure suffered by Brunei Chinese was from its Government's anti-Chinese policy that had been conducted in Brunei for a long time. Brunei Chinese are limited in education and job opportunities. They have very few political rights. But the most outrageous thing is that they are not entitled to citizenships in Brunei even if they have been living there for generations. According to the *Asia Yearbook: 1983* (Punwani and Chiu 1983:120), "the Chinese question remained Brunei's most serious unresolved political problem. About 30% of the population is Chinese and most of them are not citizens but British-protected permanent residents holding Brunei British passports." A number of respondents from Brunei commented on their reason for emigration using exactly the same words: "no citizenship." The situation of Chinese in Malaysia is similar to that in Brunei, where "constitutional provisions explicitly distinguish citizens on the basis of ethnicity. For the most part these provisions were aimed at balancing political privileges for the Malays and other indigenous peoples against the economic power of 'immigrants,' especially the Chinese" (Brown 1976:80). Most Chinese in the People's Republic of China were dissatisfied with their government and the political system of their country for a long time. But the emigration of Chinese from China at a noticeable level became possible only when the government began to relax its emigration restrictions and conduct "open door" economic policies in recent years.

Table 6.2: Average score given to selected reasons for emigration, by origins

Regions of origin	Political reasons	Children's education	All other reasons
Hong Kong	4.6	3.4	2.1
Brunei	4.5	4.0	2.3
P.R.China	4.3	3.2	2.5
Malaysia	4.0	4.8	3.5
Taiwan	3.0	3.8	2.2
Singapore	2.3	2.3	1.5
Others	4.1	3.2	2.4

The second most cited reason for emigration as shown in Table 6.1 was "inadequate educational facilities for children." It was also the highest ranked reason for immigrants from Malaysia and Taiwan, as shown in Table 6.2. Expecting children to grow up successfully, even to stand out among their fellows is an important part of Chinese culture. Many Chinese parents believe that for children to obtain a good education is crucial for their future success. Apparently most of the Chinese immigrants under study are from densely populated countries or regions, where there is a lack of opportunities and facilities for higher education. Malaysia and

Brunei Chinese also worried that their children could not internalize enough Chinese culture and values in their original countries because of government policies.

The rest of the reasons were scored between 1.9 and 2.5, which were below "of some importance." Therefore, the dominant reason for emigration for most Chinese regardless of their regions of origin was actually quite simple. They fled away from either political bitterness, or lack of educational opportunities for their children, or both.

The "Other reasons" for emigration mentioned on the questionnaire included: "stay away from Communism," "racial discrimination in home country," which were comparable to the political reasons listed in the question and "fear for personal safety," "lack of peace and order in home country," and "the huge nuclear power plant to be built in Guangdong, China."

6.3. Goals to be achieved by emigration

The Chinese immigrants under study are predominantly independent immigrants. Most of them are professionals and business people. It is true that many of them were under pressure when they decided to emigrate to another country, but they were by no means in such an emergency life-or-death situation that they had to escape immediately from their home countries. They chose to leave because they had certain goals that they thought could better be achieved or could only be achieved through emigration. The second question in the section of motivation was concerned with various goals. Again, the goals were assessed in a closed-format question, where 5 scores of importance were assigned to the items of goals. Table 6.3 shows the total and average scores given by the respondents to each goal, along with total number of responses received by each of them. In the table, political security and children's education lead the importance of goals of emigration. Obviously, Table 6.1 and 6.3 together show a consistency between the "push" and "pull" factors of international migration.

The scores given to the two most important goals by immigrants from different origins show a similar pattern of scoring as that in identifying reasons for emigration (Table 6.2 and Table 6.4). Political stability and security was the number one goal for immigrants from Hong Kong, Brunei and China, while better education for children ranked second. A reversed ranking was found for immigrants from Malaysia and Taiwan, where education for children was number one and political stability was number two. Taiwan immigrants, while scoring relatively low on most reasons for emigration and goals to be achieved through emigration, scored very high, second only to Malaysia Chinese on the goal of getting better education for children. The fact that well over 10,000 Chinese visa students come to Canada every year, might indicate how important Canada is for the Chinese to

Table 6.3: Score of importance by goal to be achieved through emigration

Goal	Total score	Number of responses	Average score
Making good money, high standard of living	497	185	2.7
Easy & comfortable life, more leisure time	617	185	3.3
Comfortable housing	649	185	3.5
Opportunity of getting good education	663	185	3.6
Having a prestigious job	510	185	2.8
Honor of family, being looked up to in community	427	185	2.3
Children have better education	759	185	4.1
New lifestyle, doing new things	519	185	2.8
Join family members, near friends or relatives	513	185	2.8
Political security, free to say and do what you want	824	185	4.5
Others		7	

obtain education. As Table 6.5 shows, between 1985 and 1990, students from the six source countries who are predominantly Chinese accounted for over 30% of the total visa students in Canada. In fact, Hong Kong was the largest source of visa students in Canada every year during that time period, while Malaysia ranked third in both 1985 and 1986, and China ranked second in 1989, third in 1988 and fourth in 1986, 1987 and 1990. The decrease in number of visa students from China in 1990 might have been resulted from the special immigration program offered to the Mainland Chinese students in Canada after the 1989 "Tiananmen Massacre" in Beijing. By the end of 1990, a significant number of visa students from China had obtained their Canadian permanent resident status and therefore lost their status as visa students. The number of visa students from Taiwan was relatively small because majority of them went to the U.S., where for many years the largest number of foreign students in U.S. colleges and universities had come from Taiwan (Myers 1989; Chou 1989).

Table 6.4: Average score given to selected goals of emigration, by origins

Regions of origin	Political stability	Children's education	All other goals
Hong Kong	4.5	4.0	2.8
Brunei	4.7	4.3	3.6
P.R.China	4.3	3.8	2.9
Malaysia	4.0	4.8	3.7
Taiwan	3.0	4.5	3.1
Singapore	2.0	2.3	1.8
Others	4.1	4.0	3.2

Table 6.5: Visa students from Chinese dominated sources: 1985-1990

Source	1985	1986	1987	1988	1989	1990
Hong Kong	14,362	13,026	13,089	13,881	14591	14170
Malaysia	3,381	2,369	1,967	2,001	2145	1904
China	1,498	1,996	2,471	4,618	7434	6156
Singapore	1,614	1,559	1,537	1,732	1820	1552
Taiwan	367	458	659	1,315	2217	3351
Brunei	138	119	103	84	78	78
Total	21,360	19,527	19,826	23,631	28,285	27,211
% of total visa students in Canada	39.9	37.4	36.5	37.2	38.4	33.9

(Source: Employment and Immigration Canada 1985;1986;1987;1988;1989;1990)

In addition to the two main goals, the following also received relatively high scores, with sources of the respondents specified in brackets: "Making good money, high standard of living" (China), "Easy & comfortable life, more leisure time" (Taiwan, Singapore and Brunei), "Comfortable housing" (Hong Kong and Taiwan), "Opportunity of getting good education" (Hong Kong, Brunei and Malaysia), and "Join family members, near friends or relatives" (Other sources). The "Other reasons" for migration mentioned on the questionnaire included: "to fulfill a dream (of becoming a citizen of a country)," and "curious about other countries."

Table 6.6 shows the result of 133 responses to the specific reasons for emigrating to Canada instead of other countries. Eleven items of reasons were presented and the respondents were asked to tick as many items as applicable. The three most cited reasons for migrating to Canada instead of other countries were: "multicultural society, easier to survive as new immigrants," "good opportunity of getting higher education for self or for children" and "good social welfare (*e.g.*, health insurance and old-age pension)." Many people also stressed that it was easier or only possible to migrate to Canada due to recent Canadian immigration policy. Those specific reasons cited by immigrants actually reflect the special features of Canada that have been perceived and attracted international migrants. Nearly two thirds of the respondents cited relatives or friends in Canada as one of their reasons to choose to come to Canada, although only 30.6% of them belong to the class of "Assistant Relatives." This shows a profound impact of earlier immigrants on the decision of later immigrants through ties between family and friends, and thus forms a "migration chain" (Goodall 1987:304). Interesting enough, the three least frequently cited reasons for choosing Canada as migration destination were "good investment environment," "career-related; advancement in job," and "high income, high standard of living." Besides the fact that "Investors" account for only 3.8% of the sample, the data have indicated that high income and living standard and career reasons were not what most of the Chinese came to Canada

for. Reasons mentioned as "other reasons" included: "stable government," "not a Communist country," "less racial discrimination," "curiosity," "had studied in Canada before," "has a big family in Canada," and "has job offers in Canada."

Table 6.6: Specific reasons for emigrating to Canada

Reasons	Number of responses	% of total
Canadian citizenship for security	97	72.9
Easier to be granted immigration	71	53.4
Language is no barrier in Canada	82	61.7
Multicultural society, easier to survive	105	78.9
Good investment environment	16	4.5
Career-related; advancement in job	31	23.3
High income, high standard of living	43	32.3
Good social welfare	98	73.7
Good opportunity of getting higher education	102	76.7
Relatives or friends in Canada	87	65.4
Canada was not the first choice	9	6.8
Other reasons	13	9.8

6.4. Constraints of emigration

Constraints play an important role in the process when a potential migrant decides whether to move or not. Besides visa control and language barriers which are crucial to international migrants, migration over a long distance also involves tremendous cost, both financially and psychologically. There is also a chance that people are faced with too little or too much information that lead them to either too much uncertainty about a new country, or too much stress resulting from information overload. Therefore, people may give up the idea of seeking a new country before they really start once the constraints appear to be too obvious and strong to overcome.

The fact that those immigrants ended up migrating into Canada is a result of the combination of three factors: the factors pushing them away from their home countries, the goals they expected to achieve through migration, and the constraints they faced in getting into another country. One question was asked on the survey questionnaire about the major constraints that had made migrating to another country difficult. Items of constraints were presented on the questionnaire and the respondents were asked to check as many items as applicable. A total of 187 people responded to this question (Table 6.7). Only 8% of the respondents

responded that they did not feel any constraints. The three most cited constraints of emigration were: "afraid of being unable to find a job in the new country," "not sure what would happen to you in the new country" and "difficulty in obtaining an immigration visa." Canada is one of the few nations in the world that has its door open to immigrants, especially since the mid-1980s when new business immigration programs were introduced. Naturally, it became the only choice for those who had limited options. Some respondents wrote: "There was nowhere else in the world would take me," "I tried, but only Canada accepted my application (of immigration)." The item "language difficulty" was not listed on the original questionnaire. Still, 12 people (6.4% of total) mentioned it as one of the "other constraints." Among "other constraints" there were "sadness of leaving home country," "different life style," "worrying about if kids can cope with new environment" and "racial discrimination in a new country."

Table 6.7: Major constraints of emigration

Constraints of emigration	Number of responses	% of total
Difficulty in obtaining an immigration visa	78	41.7
Financial cost of moving	51	27.3
Afraid of being away from family or friends	68	36.4
Afraid of being unable to find a job in the new country	126	67.4
Not sure what would happen to you in the new country	88	47.1
Language difficulty	12	6.4
Other reasons	7	3.7
No constraints	15	8.0

There is subtle difference in the kinds of constraint perceived by immigrants from different origins. Table 6.8 shows the number of responses to constraints of emigration as a percentage of the total respondents in that immigrant group. The mainland Chinese felt stronger about visa difficulties than the rest of the immigrants, while they felt less worried about what would happen to them in a new country. Malaysia Chinese mentioned more than others the financial cost of moving. Overall, uncertainty about jobs as well as the general conditions in a new country were mostly identified as constraints of emigration by Chinese of almost all origins.

Although the people under study are immigrants who voluntarily chose to migrate to Canada, 92% of them cited various constraints of emigration they had encountered during their decision-making process of leaving their home countries. This might give an indication of why many other people with similar socio-economic backgrounds as these immigrants chose to stay at home coping with their stress. Migration would not be an option for people who see constraints as

Table 6.8: Constraints of emigration, by regions of origin

Regions of origin	Number of responses to constrains as % of total					
	Visa	Cost	Family	Job	Uncertain	No constraint
Hong Kong	36.13	25.12	32.77	70.59	41.18	10.1
Brunei	40.91	40.91	40.91	68.18	59.09	9.1
P.R.China	66.67	22.22	55.56	61.11	44.44	5.6
Malaysia	33.33	66.67	50.00	83.33	66.67	0
Taiwan	33.33	0	50.00	66.67	83.33	0
Others	66.67	11.11	11.11	33.33	55.56	0

too obvious and too strong to overcome, regardless of other factors. It might also suggest that once some of those constraints of emigration are alleviated, for example, the newly passed immigration bill by the U.S. Congress which would allow special immigration status to entrepreneurs, the overall pattern of immigration to Canada might be affected. According to the *Far Eastern Economic Review* (Awanohara 1990), under the current law, Hong Kong is allocated 5,000 visas a year. The new legislation will increase that to 10,000 visas a year for three years, after which Hong Kong will be given full country status for immigration purposes. The maximum number of visas Hong Kong can get under skills and family unification provisions will rise to 27,000. In addition, in the second, third and fourth years of enactment, an additional 12,000 visas will be made available to executives and managers of U.S. companies based in Hong Kong, if they are transferred to the U.S. In a major exception to the rule, Hong Kong residents who are granted U.S. visas will not have to move to the U.S. within a short period; the visas will remain valid until 2001. This provision stems from the aim to boost confidence so people will remain in Hong Kong and help keep the colony economically viable before and immediately after control reverts to China in 1997. This exception will undoubtedly be appreciated by potential Hong Kong emigrants and therefore it is likely that the rush of Chinese immigrants to Canada might be redirected to the U.S.

6.5. Uncertainty perceived by immigrants

Whether or not an individual will reach the decision to migrate also depends on the personal traits of that individual, in terms of feelings of uncertainty and willingness to take risks (Haberkorn 1981). Here, uncertainty refers to the kind of feelings that springs from the potential migrant's inner experience: uncertainty about success or failure of the approaching move, uncertainty about the future. It is also called internal uncertainty in contrast to external uncertainty, as was discussed in

Chapter 2. The top two most cited constraints of emigration, as shown in Table 6.7 actually reflect those immigrants' fear or consideration of the uncertainty that would be associated with their moving to another country. Over two thirds of the respondents worried whether they would be able to find a job in the new country (actually this also has to do with external uncertainty), while 47.1% of them were not sure what would generally happen to them in a new country. The answers given by immigrants of different regions of origin did not differ very much (Table 6.8). The result indicates that uncertainty was widely experienced by Chinese immigrants to Canada during their decision-making process. Most of them might have tried to avoid or reduce the uncertainty by collecting information about the new countries, or imitating the successful pioneering immigrants whom they knew. But undoubtedly there were many people who chose to absorb the stress by altering their need set, if they could not alter the environment, in order to avoid any risk associated with moving to a new country.

How people experience and deal with uncertainty at the stage of making a migration decision directly affects their behavior in choosing a new location at a later stage. It might end the decision-making process without seeking a new location at all. However, it might also initiate a "vigilant information process" to reach a "high quality" decision on where to move (Janis and Mann 1977).

In this chapter, some research findings of recent Chinese immigrants to Canada were presented. Political situation and children's education topped the various factors that drove the Chinese away from their original countries or regions. Correspondingly, looking for a stable and safe political environment and better opportunities for children's education were the most important goals they had expected to achieve through migration. The source of stress that triggered the decision to emigrate came from both long term dissatisfaction with home situation, such as the one experienced by Brunei immigrants, and specific events that had called people's attention to a real loss soon to be expected, such as the one for Hong Kong immigrants. These findings for Chinese immigrants differ from those for Indian immigrants, for whom career reasons were the most important (Winchie and Carment 1989). The perception of Canada's multiculturalism, less racial discrimination, and good educational opportunities were special reasons for more than 75% of the respondents to choose to migrate to Canada. The study also revealed the constraints and uncertainties that had been perceived by the Chinese immigrants during their decision-making process of emigration. Many people admitted that uncertainties about job opportunities and generally what would happen to them in a new country made it difficult for them to decide whether to emigrate or not. Immigration control was another frequently cited constraint that had made their options limited. Exactly how risk and uncertainty had affected their way of choosing a decision strategy, evaluating different alternatives and searching for information will be discussed in the next two chapters.

Chapter 7

Search for a dominance structure in migration

This chapter is concerned with the second major stage of a migration decision-making process—the relocation decision—in contrast to the decision to migrate to a new country discussed in Chapter 6. A potential migrant is assumed to have decided to migrate to another country and the ultimate decision at this stage is to choose one destination out of several alternatives. In this chapter, a multi-stage model will be used to describe how potential migrants evaluate options of migration destinations, eliminate those that are not satisfactory according to certain decision procedures, and finally choose one as their migration destination. Attention will be focused on the cognitive structure within which a decision-maker combines information and works towards the final decision. Another important issue that is closely associated with the process, namely risk involved in the evaluation will be discussed in the next chapter. Results from the questionnaire survey of Chinese immigrants are presented to verify the validity of the theoretical model.

7.1. Why the model of dominance search?

Three reasons have made the search for a dominance structure especially applicable in migration decision-making. First, the model is flexible to accommodate different aspects of the rational/irrational debate of decision-makers. A dominance structure can be constructed in different ways, where different degrees of rationality are represented in different decision strategies involved. Choosing a migration destination, especially among those that are as far as in another continent is a complex decision and involves high cost and risk. The difficulty of the task

gives decision-makers the incentive to make careful and high quality decisions so they will not have to regret or undo it, once the decision is made and subsequent action is taken. It is reasonable to assume that most migration decision-makers have the intention to find the best destination they can and to perform more operations than in other smaller decisions in their lives to convince themselves that the choice they have made is the best. However, as commonly assumed of other human decision situations, migration decision-making is also described in terms of "bounded rationality," in that people act fairly rationally within their cognitive limits. Exactly how rational each judgment is depends on each individual decision-maker. Dominance search is a model that allows people to make the best decision they can, or as they see it. It is compatible with both more or less 'rational' and 'irrational' decision-making behaviors.

Secondly, the search for dominance structure sees human decision-makers as limited information processors, which is also true for potential migrants. Empirical findings of intra-urban migration (*e.g.*, Adams 1969; Barrett 1973) have revealed a good amount of directional and distance biases in potential migrants' spatial search. The fact that "most migrants acquire little information before choosing a destination" (Goodman 1981:147) may be due to several reasons. One of them is that decision-makers try to cope with information overload by purposely ignoring some of it. Another reason concerns the cost involved in acquiring information that makes decision-makers focus on less than enough information. Both operations may lead the decision-makers to overlook information that is important to their decisions and in turn to less than best decisions. Moreover, migration decision-making is generally followed by an action, which is moving from one place to another. People are anxious to put their decision into action. This raises restrictions in the amount of time they can spend on searching and evaluating information and thus makes them limited information processors. Again, exactly how much information is involved in each decision process and how good the quality of information is depend on each individual decision-maker.

Thirdly, the search for dominance structure implies that an individual decision-maker intends to pursue the chosen alternative. Specifically, before the decision is made, the decision-maker has a hypothesis about the choice, which is also called 'the promising alternative.' As was pointed out by Gould and White (1986), people have different perceptions of the places in the world, which are formed from a highly filtered set of impressions. Those images, in turn, influence their preferences of the places they want to live in, or want to migrate to, although the images are strongly affected by the information they received through the filters such as TV and newspaper, and may be highly biased. Empirical studies (*e.g.*, Lansing and Mueller 1967; Goodman 1981) revealed that migrants typically considered very few, if any, alternative destinations before moving. This might also be an indication of their trying to stick to what they have in mind as the best

destination. As a result, during the decision process the individuals are actually trying to build up a stable enough intention to act in line with the promising alternative that they have had earlier in mind, even if the kinds of new information they get are not all positive.

7.2. Dominance search in migration

Search for a dominance structure is therefore the basic rule of choosing a migration destination. As were defined in Chapter 2, the subjects in this study were independent decision-makers who were facing two or more alternative migration destinations, and who had the freedom of making a choice among those alternatives. The purpose of a decision-making process is, after a series of judgment and comparison of various properties at alternative destinations, to find one destination that could best help the decision-makers achieve their goals of migration. The general idea is similar to that of choosing a location with the highest level of place utility, the one that has been frequently cited in many existing migration studies. The use of Montgomery's framework introduces a new element—a decision process involves an attempt to construct a dominance structure, which justifies the choice of a tentatively chosen migration destination. Furthermore, search for a dominance structure is assumed to be compatible with using various decision strategies, rather than only a linear, additive compensatory strategy as is implied in all the utility maximization based studies. Non-compensatory maximizing strategies are equally important in the search for a dominance structure. The decision rules involved in the process are listed in Table 1.1 and discussed in Chapter 2. It is assumed that those decision rules serve local functions in the decision process by serving as operators in the search for a dominance structure. The following model try to describe what goes on in migration decision-makers' mind as they evaluate and compare alternative potential destinations, eliminate most of them and finally choose one as the final decision.

In migration decision-making, a dominance structure is equivalent to a representation where one potential destination has at least one advantage compared to other potential destinations, and where all disadvantages associated with that destination are neutralized or counterbalanced in one way or another.

Based on Montgomery's model of search for a dominance structure (Montgomery 1983), the decision-making process of a potential migrant is seen to go through the following four phases:

(1) pre-editing: The goal of this phase is to delimit the decision problem by selecting those potential destinations and place-related properties that should be

included in the dominance structure. In other words, it separates relevant information from less relevant information that can be discarded in subsequent information processing. For example, employment opportunity, salary and type of climate of a place are relevant properties while the distribution of rivers and mineral reserves are not for many migrants. This process helps to organize options so as to make the subsequent evaluation more purposive and efficient.

The operations in the pre-editing phase are of two types:

1. *Selecting and evaluating properties*
   Migration decision-makers evaluate place-related properties that are important in their decision situation. This is a personal judgement and may result in discarding certain properties from further consideration for all or some alternative destinations. The properties of a place are the basic units of evaluation for a migration decision-maker. The significance of a property depends on its utility (how much it helps the migrant achieve a certain goal) and the importance of the property in the overall decision. In this operation, a decision-maker tries to weigh the importance of the properties relative to one another. This may not necessarily mean that the decision-maker list various properties in the order of importance in their mind before doing anything else. But when it comes to evaluate properties among alternative destinations, the decision-maker judges the significance of each property both by its utility and relative importance.

2. *Screening*
   Migration decision-makers select potential destinations with some chance of becoming dominant or discard destinations that have a very small chance to be seen as dominant over other destinations. Meanwhile, the decision-maker may keep some discarded destinations in mind in later stages of the decision process to check whether one destination indeed dominates the others. It is assumed that people screen alternatives by choosing only those whose utility on all properties meet a set of criteria, or by eliminating those whose utility of the most important property does not reach certain criteria. The decision-maker repeats the procedure of elimination with new properties in order of importance. Sometimes, an alternative may also survive the screening although some of its property utilities do not meet the criteria as long as the drawbacks can be compensated by high utilities on other properties. The propositions suggest that conjunctive rule, elimination by aspects rule and addition of utilities rule, are related to this operation.

(2) finding a promising alternative: The goal of this phase is to find one potential destination that has a reasonable chance to be seen as dominant over the other potential destinations selected in the pre-editing phase. The selection

is based on either choosing the only alternative whose utility on at least one property exceeds or is equal to a certain criterion, while the utilities of all the properties of other alternatives fall below or are equal to the criterion values, or choosing an alternative over another if it has a higher utility on the most important property than the other one. If this requirement is not fulfilled, the choice is based on the utility of the property next in order of importance. This means disjunctive and lexicographic rules are related to the finding of a promising alternative. Meanwhile, the finding may also be done by adopting the elimination by aspects rule, that is to eliminate all alternatives whose utility does not exceed a certain criterion on the most important property, and repeat the procedure with new properties in order of importance.

There are several points that need to be stressed:

1. Pre-editing and finding of a promising alternative imply that a migration decision-making process acquires certain directionality, in that certain destinations and properties of destinations will receive more attention than others in subsequent decision-making phases. This sounds reasonable because decision-makers are limited in their ability to deal with too much information at the same time. The easiest way for them is to focus their attentions on a few destinations and properties at a time. Only when the information under evaluation could not result in a promising destination, or it contradicts severely the original images of the decision-maker of those favored destinations would they switch their attention to other destinations.

2. The directionality may be particularly strong in stress situations of various kinds, or in other words, when the push factor at the place of origin is strong. In that case, potential migrants usually do not bother to evaluate, or think carefully about many possible alternatives, since they are too eager to leave the present location to spend much time on selecting. They would tend to focus on the place they are most familiar with, or one which seems to be the easiest to move to, and see that one as a promising alternative. In an extreme situation, a decision-maker may use satisficing instead of any of the maximizing rules. In that case, the decision-maker simply sticks to the first alternative he/she has encountered for which utilities meet the minimum satisficing level on all properties.

3. Shifts in the directionality may occur several times in the process, particularly when the decision-maker fails to find a dominance structure at subsequent phases for a promising destination. In that case, the decision-maker may either give up or postpone the decision of looking for an alternative destination, or come back to the earlier phases to start over again if he/she thinks that it is worthwhile to continue the decision process.

4. Often the reason why people feel inclined to choosing, or not choosing, a particular destination is that other people support or oppose the choice of this destination. When there is a social norm that prescribes certain destinations, or there has been a flow of people moving to those destinations, the decision-makers are likely to find themselves attracted to those destinations. The influence from other people may affect the decision-maker's evaluation on both the utility of a property and the relative importance of that property.

5. Serious collection of information may be conducted at the phase of finding a promising alternative, with regard to the potential destinations and attributes being selected at the phase of pre-editing.

(3) dominance testing: The goal of this phase is to actually find out whether a promising destination can be seen as dominant over the other potential destinations, or in other words, whether a promising destination has any disadvantages in relation to other potential destinations.

Two types of evaluations could be used for the dominance testing, which also occur in the previous decision-making phases: (1) *absolute* evaluations of single property utility with regard to certain criteria; and (2) *comparative* evaluations between utilities of the same property across different potential destinations. The formulation of a dominance structure should be based on the latter type of judgements and not on absolute judgements. The testing is usually done by choosing one alternative over another if the first one possesses utility that is higher than the second on at least one property, while not lower on any other properties. This is the dominance rule of decision-making. The lexicographic rule may also be involved when a decision is made because one alternative is superior to another one on an important property.

A potential migrant's decision-making process ends when he/she has evaluated, as he/she sees it, all relevant information and the promising destination is perceived as having at least one advantage compared to the other alternatives, and no disadvantages. If not, he/she will have to go through the next phase.

(4) dominance structuring: The goal of this phase is to eliminate or neutralize any violations of dominance for a promising destination that have been found in the dominance testing phase. If this succeeds the potential migrant will reach his/her final decision of selecting one migration destination. If, on the other hand, dominance structuring fails, the potential migrant may return to the pre-editing or finding a promising alternative phase and attempt to redefine the decision problem and/or to find a new promising destination. Alternatively, the potential migrant could postpone the decision, if this is possible.

Several types of operations may be applied in the dominance structuring phase. One of them is to de-emphasize the disadvantage(s) of a promising alternative. For example, the weather condition of Canada seems to be a concern for many potential emigrants from Hong Kong. But once a decision-maker chooses Canada as the promising destination, he might argue that the cold is not a problem. If other people can cope with it, so can I. Another operation is to bolster either the positive aspects associated with a promising destination, or the negative aspects associated with non-promising destinations. The attempt is to enhance the attractiveness of a promising alternative. The United States seems to be a better place to do business for it has a bigger market. But it has tougher immigration restrictions. Nothing could be worse than being rejected by the immigration office. So let's settle for Canada. Here the decision-maker may have exaggerated the difficulty of obtaining a U.S. immigration visa to justify his decision on applying for immigration to Canada. De-emphasizing and bolstering are not very rational ways of constructing a dominance structure. A more rational operation might be cancellation, when a decision-maker offsets a disadvantage by a related advantage, such as to cancel out the high cost of living with the excitement of living in a big city. Cancellation is useful only if the promising destination has some other advantage besides the advantage used for cancelling. Otherwise a dominance structure could not be reached for that destination. Collapsing is another operation used in dominance structuring. It implies that two or more properties are collapsed into a new, more comprehensive characteristic. The most common types of collapsing suggested by migration decision-making studies are, when a number of properties are redefined in monetary terms (cost-benefit analysis) and in terms of overall place utility. In the latter case, for example, income and minimum temperature in winter are the two properties under consideration, and a decision-maker wants higher income and warmer temperature. City A offers \$50,000 annual income and $-10°C$ while city B offers \$30,000 income and $+10°C$ temperature. The decision-maker will tend to choose A over B since money is more important then temperature. But what if city A is replaced by city C which offers the same money as in A but the temperature drops to $-40°C$? The disadvantage of temperature in city C is too obvious and it does not seem to be worth living in city C in $-40°C$ rather than in city B in $+10°C$ for only \$20,000 more a year. However, if City D offers \$70,000 a year and has the same temperature as in city C, the decision-maker may choose D over B even if the disadvantage on temperature is still obvious. It is because the advantage on income is big enough to compensate for the disadvantage on temperature in city D. In this example, the decision-maker weighs the importance of different properties and compares the utilities of each property between alternative destinations. This is like translating many determinants into a single-dimensional level of place utility. Decision-makers are motivated by a desire to maximize the overall level of utility.

Therefore, compensatory rules, such as maximizing the number of attributes with a greater attractiveness rule and addition of utilities rule are closely related to the stage of dominance structuring.

A flowchart of this migration decision-making process is shown in Figure 7.1.

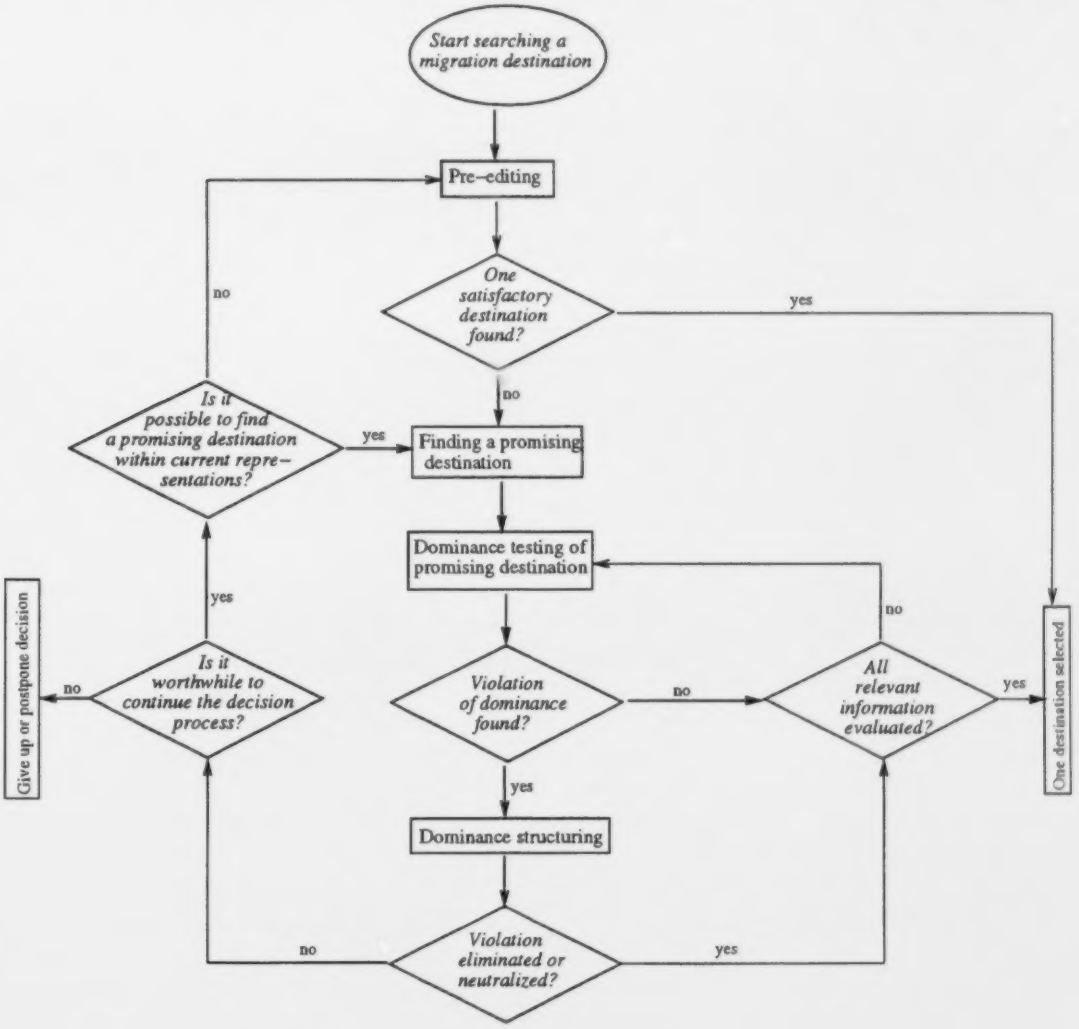


Figure 7.1: A dominance search model of migration decision-making (after Montgomery 1983)

As is discussed above, search for a dominance structure may reflect varying degrees of rationality or ability in the migration decision-making process, for there

are many ways of constructing a dominance structure. Some of these ways are sensitive to wishful thinking and other cognitive distortions, such as de-emphasizing and bolstering, whereas others are particularly suitable for sound, reality oriented thinking, such as addition of utilities (Montgomery 1983).

In the next section, an attempt will be made to demonstrate how people in the real world make decisions in approximately the same way as was described in the model. Although the Chinese immigrants participated in the survey might not necessarily be aware that there existed a sequence of phases as they looked for a migration destination, the findings show that the behavior of most of them who had performed certain operations, adopted certain decision strategies and conducted certain information search, coincided with the description of the staged model. Furthermore, the four-phase sequence does not necessarily imply that potential migrants go through sharply differentiated phases in a completely orderly way. A decision process may involve a great deal of fluctuation back and forth since "earlier questions keep cropping up if they have not been resolved," and the main function of the conceptualization of the sequence is "to provide a useful framework for analyzing how the decision-maker's coping pattern is related to responsiveness to new information and to changes in his decisional balance sheet as he moves from one step to the next" (Janis and Mann 1977:178).

7.3. Information in the search for a dominance

The order in which a decision-maker seeks and evaluates the information of a decision problem is related to the cognitive process leading to the final decision (Svenson 1979). More specifically, the way information is acquired may indicate the decision rules that are used. Besides, information search also plays an important role in reducing the amount of uncertainty in a migration decision-making process. Therefore, the issue of information search and evaluation is crucial to the understanding of a decision-making process.

7.3.1. Information search patterns

In presenting the decision problem in the previous discussions, the alternatives are specified from which a decision-maker will make a choice, and so are the place-related properties to be evaluated at the alternatives. However, as was pointed out by Hayes (1989), in real life, decisions usually do not present themselves in such a neat form. More often, the decision-maker must actively search out alternatives and evaluate their properties to find those important enough to be considered in making the decision.

Four types of information search and processing methods are assumed to be compatible in the search for a dominance structure:

1. Intra-alternative search: A decision-maker uses potential destinations as reference points for the search, *i.e.,* all the properties of one destination will be investigated before going to the next potential destination;

2. Intra-attribute search: A decision-maker uses properties of places as reference points for the search, *i.e.,* the aspects of one property for all potential destinations will be investigated before going to the next property;

3. Incomplete search: Most decisions are made without a complete search of information, since (1) search involves costs, such as direct costs (out-of-pocket expenses), opportunity costs (whatever is foregone because of the search) and psychological costs. A migration decision-maker may perceive the benefits of search to be outweighed by the costs, even without any careful calculations, and (2) a decision-maker cannot cope with too much information at the same time (Bronner and De Hoog 1984; Jacoby *et al.* 1974). In fact, "numerous studies suggest that people have difficulty keeping more than seven or so 'chunks' of information in mind at once" (Russo and Schoemaker 1990:114). Information overload can lead to too much psychological stress and confusion of decision-maker;

4. Preference search: Decision-makers search information with regard to only those destinations for which they have a preference, and those place-related properties they consider as important to their decisions. The newly obtained information is functional for checking information that is already stored in their memories, or for justifying their preferences. This is what decision-makers actually do to construct their dominance structure (Bronner and De Hoog 1984). The search is therefore more efficient since the decision-makers know what specific kind of information they want.

7.3.2. Sources of information

Sources of information are usually distinguished between (1) information retrieved from memory, and (2) externally available information. Information acquired from external sources and the way it was acquired is always more interesting for researchers, not only because it deals with some real activities of search of information and has to do with important issues such as cost of search and optimal amount of search, but also it demonstrates the interactions between the sending and receiving regions of migration, and therefore offers useful policy implications. The sources of externally available information include formal (market) sources such

as newspaper advertisements, and placement agencies, and friends and relatives known as informal sources. Many studies (*e.g.,* Goodman 1981) have indicated that movers are more likely to act upon information from friends and relatives than upon information from other sources. Rossi (1955) found personal contacts to be the most effective information source, defining effectiveness by the ratio of the percentage of movers finding their ultimate destination through that source to the percentage of movers using that source.

The above specified types of information search patterns and major sources of information revealed from the survey of Chinese immigrants will be presented in the next section.

7.4. Decision-making experiences of Chinese immigrants

Hypotheses 1 to 11 were formulated representing crucial points of the theoretical model of search for a dominance structure. Findings from the empirical survey of recent Chinese immigrants in Edmonton were used to verify statistically the validity of these hypotheses and therefore the model.

Hypothesis 1:
Migration decision-makers usually consider only a few place-related properties that they think are important, rather than a complete list of them in evaluating different migration destinations.

On question 16 of the survey questionnaire (*Appendix D*), nine items of information were listed (plus an "Others") and the respondents were asked to tick as many kinds of information as applicable that they had searched for before coming to Canada. Table 7.1 shows the number and percentage of respondents who fell into each category of the number of information items searched. Given a list of nine items of information, most respondents, except 21 (accounting for 11.2% of the total) searched for far less than what were listed. 53.5% of them searched five items of information or fewer, while 3.2% did not conduct any information search at all. Four people mentioned one more item each that was not listed. Only one respondent said he had "searched every bit of information regarding Canada."

Immigrants of different backgrounds searched for different amount of information. For example, when the respondents are examined by their class of immigration, the average number of types of information searched by investors was 7.4, by entrepreneurs and self-employed immigrants 6.0, by other independent immigrants 5.3, and by assisted relatives 4.3. Apparently, people put different

Table 7.1: Number and percentage of respondents, by number of types of information searched

No. of information searched	Number of respondents	% of total respondents
0	6	3.2
1	12	6.4
2	18	9.6
3	16	8.6
4	27	14.4
5	21	11.2
6	21	11.2
7	22	11.8
8	23	12.3
9	21	11.2
Total	187	100.0

efforts into the search depending on how important the information was to them, or in other words, how well they could do without the information. To invest in a new country before even reaching it involved a high cost and financial risk. It made the investors more cautious and they tried not to overlook any important information. On the other hand, assisted relatives did not have to worry about every detail of the new country since their move involved lower financial cost and risk. Once they encountered problems they had not expected, they had relatives to count on. Even if they later found out that the decision was a mistake, the cost of correcting the decision would not be as high as that for the investors. When examine the respondents by their age, the average number of types of information searched by 19-year-olds and under was 3.0, by 20–35-year-olds was 4.8, by 36–50-year-olds was 5.6, and by 50-year-olds was 5.0. This might imply a relationship between decision makers' age and their attitude towards information, or risk. Younger people who were more adventurous, or had less to lose by migrating to another country treated information less seriously then older people. The differences between people of different gender and different last permanent residence in the amount of information acquired were found not significant.

With regard to the types of information that had attracted the immigrants' attention, Table 7.2 shows answers from 183 respondents who checked at least one type of information in this question. "Job opportunity," "educational opportunity" and "possibility of being granted immigration" were the three types of information that received most attention. The "Other" types of information mentioned by respondents included: "if the country is culturally active or not," "assimilation (of immigrants into the local community)," and "(possibility of being granted) citizenship."

Table 7.2: Types of information searched by respondents

Types of information	Number of responses	% of total
Investment opportunity	49	26.8
Job opportunity	131	71.6
Salary	87	47.5
Climate	100	54.6
Housing condition	115	62.8
Social welfare	116	63.4
Educational opportunity for children & self	129	70.5
Political and racial atmosphere	125	68.3
Possibility of being granted immigration	127	69.4
Others	4	2.2

Hypothesis 2:
Most people consider only a few alternatives before making their decisions. In other words, potential migrants tended to, from the beginning of the process, focus on the few countries they already had a preference for before any serious search of information was conducted.

The number of countries a migrant ever considered as alternative migration destinations ranged from 0 to 7, with one respondent indicated that she did not consider any other country at all. The number of countries about which information was searched by an immigrant also ranged from 0 to 7. The average number of countries an immigrant considered as potential destinations and the average number of countries about which information was searched by an immigrant was 1.88 and 1.62, respectively (Table 7.3). As many as 78.1% of the respondents considered 2 or fewer countries as their potential migration destinations, while 87.2% of them searched 2 or fewer countries for information concerning immigration. Only 21.9% and 12.8% of the respondents considered and searched for information about 3 or more countries, respectively.

Immigrants of different backgrounds also show a difference in the number of countries they considered as well as conducted a search for information (Table 7.4). Investors lead other classes of immigrants in number of countries considered as potential destinations as well as number of countries for which information was really searched, while assisted relatives ranked the last in both cases. There was also an increase in number of countries considered and searched as the respondents' age group increased, before they reached the age of 50 and older. These were consistent with the earlier findings on the difference in the number of types of information searched among people of different class of immigration and age group. People over 50 years of age did not search as much as those between 20 and 50 years of age. This could be affected by their being over-represented by assisted

Table 7.3: Number and percentage of respondents, by number of countries they considered for migration and searched for information

Number of countries considered	Number of respondents	% of total	Number of countries searched	Number of respondents	% of total
0	1	0.5	0	3	1.6
1	80	42.8	1	104	55.6
2	65	34.8	2	56	30.0
3	30	16.0	3	15	8.0
4	7	3.7	4	6	3.2
5	2	1.1	5	1	0.5
6	1	0.5	6	1	0.5
7	1	0.5	7	1	0.5
Total	187	100.0	Total	187	100.0

Table 7.4: Average number of countries considered and searched by an immigrant, by class of immigration and age group

Class of immigration	Total No. in the class	No. of countries considered	No. of countries searched
Investor	7	2.4	2.1
Entrepreneurs & self-employed	27	2.0	1.7
Other Independents	95	2.0	1.7
Assisted relatives	57	1.5	1.4
Age group			
$\leq$19	3	2.0	1.0
20-35	79	1.7	1.5
36-50	80	2.1	1.8
$\geq$50	25	1.5	1.4

relatives (Assisted relatives account for 52% in this age group and 13.4% in the sample as a whole), who generally searched less information than immigrants of other classes. Besides, level of education could be a factor associated with people's age, class of immigration and their attitude towards information and risk. Therefore, at this point a conclusion on how much the respondents' class of immigration or age had influenced their information search behavior cannot be reached because of uncontrolled third variables, and the internal relationships between the variables. Again, the differences between people of different gender and of different last permanent residence in the number of countries considered as well as countries for which information was searched were found not significant.

Table 7.5 and Table 7.6 show, respectively, the number of respondents who had thought about migrating to and who had really searched for information with

regard to the various countries listed before they made up their minds to come to Canada. Besides Canada, the two countries that were of greatest interest to immigrants were Australia and the United States. "Other countries" in Table 7.5 included: New Zealand, France, Italy, Japan, Malaysia, South and Central America without specifying any countries.

Table 7.5: Countries considered by immigrants

Country	Number of respondents who considered	% of total respondents
Canada	186	100.0
Australia	69	37.1
U.S.	56	30.1
U.K.	11	5.9
Singapore	10	5.4
Taiwan	4	2.2
Other countries	15	8.1

Table 7.6: Countries for which information had been searched

Country	Number of respondents who searched info.	% of total respondents
Canada	184	100.0
Australia	50	27.2
U.S.	42	22.8
U.K.	7	3.8
Singapore	6	3.3
Taiwan	3	1.6
Other countries	11	6.0

Hypothesis 3:
Degree of stress at the place of origin has a direct effect on migration decision strategies adopted. The more dissatisfied a person is with the environment of his origin, the fewer migration alternatives would be considered, and the shorter the time taken for a decision on a migration destination.

Unfortunately, neither linear nor curvilinear relationships have been observed from the data between the scores given to push factors at original places and numbers of destination searched, based on the Pearson correlation coefficient and the scatterplot for the two variables. The reason can be attributed to the fact that the impact of each individual factor on the number of migration alternatives considered and amount of information searched by an individual immigrant could

not be separated at this point. It might be true that a decision-maker under stress considered fewer alternatives and made a quicker decision then she would have had she not been under stress. But it is still possible that she searched more information than another decision-maker who felt less stress than her, because she is generally a more cautious and rational decision-maker who always thinks thrice before taking any actions. An investor under stress may have still searched for more information and taken longer time than an assisted relative under less stress to decide on a migration destination, for there were more risks and responsibility involved in the investor's decision. The relationship between degree of stress at the place of origin and information search behavior remains to be tested in future studies. The study design has to be able to examine one factor at a time while holding others controlled.

Hypothesis 4:
Potential migrants tend to choose for further consideration the alternative destinations that could possibly satisfy them with all the goals they expect to achieve by migration (Conjunctive rule: Table 1.1).

Hypothesis 5:
Potential migrants tend to discard in subsequent information processing the destinations that, as they see it, could not satisfy them with the most important goals they expect to achieve by migration (Elimination by aspects rule: Table 1.1).

Hypothesis 6:
Potential migrants tend to choose those alternative destinations for further consideration that could possibly offer the greatest sum of attractiveness, even though they are not satisfied with all the properties of those alternatives (Addition of utilities rule: Table 1.1).

Hypotheses 4 to 11 are concerned with decision rules that are assumed can best describe the way decision-makers combine and process their perceived information. This is not to say that decision-makers consciously follow certain decision rules, or use those rules to check their behaviors. What is suggested here is that people do have their ways of evaluating information and those decision rules could best describe what people really do. In other words, they can be seen "as stylized characterizations of the decision-making process that are consistent with the behaviors observed" (Goodman 1981:133).

Hypotheses 4 to 6 state three decision rules, namely "conjunctive (CON)" rule, "elimination by aspects (EBA)" rule and "addition of utilities (AU)" rule respectively. Those rules are assumed to be related to the pre-editing stage of the decision-making process. By applying any of these rules, a decision-maker screens

alternatives in order to select those that have some chance of becoming dominant and discard those that do not.

On the survey questionnaire, the above decision rules were listed in Question 6 (*Appendix D*). The item "It was almost impossible to immigrate to other countries" did not represent any decision rule but was also listed there in order to find out if it was the reason that some people did not use any of the decision rules. Statements about the decision rules were presented in a closed-format question and scores ranging between 1 and 5 were assigned to represent the degree of consent of the decision-makers towards each of them. Table 7.7 shows the number of respondents to and average score received by each of the three decision rules. The higher the average score was, the better the decision rule had described the behaviors of the majority of the respondents. The total number of responses to each statement in this question and Question 7 of the survey questionnaire ranged between 121 to 123, instead of 187 of the total returned questionnaire. The reason for the missing responses is that those who considered only one migration alternative were asked to skip these two questions as well as Question 8 to 12 on the survey questionnaire. There was a certain inconsistency in the responses since 81 respondents indicated that they had considered one (or 0 as one respondent indicated) country before they made up their minds to come to Canada. Therefore, only 106 responses to this question were expected to be found. However, 123 people responded. All answers were taken into consideration. For those who indicated that they did not consider any alternatives but answered Question 6 to 12, it was assumed they had considered alternative destinations, but only very briefly so they did not think those alternatives were worthy to be mentioned in Question 4 and 5 of the questionnaire.

Table 7.7: Score of importance by decision rules

Decision rule	Abbreviation	Number of responses	Average score
Those countries could possibly satisfy you with all the goals you expected to achieve as identified in Q.2 by immigration	CON	121	3.7
Those countries could possibly offer the greatest sum of attractiveness even though you are not satisfied with all the characteristics of those countries	AU	121	3.5
The other countries couldn't satisfy you with the most important goals you expected to achieve through immigration	EBA	121	3.0
It was almost impossible to immigrate to other countries		122	2.7

As is shown in Table 7.7, the conjunctive (CON) rule received the highest

average score, followed by addition of utilities (AU) rule. Both scores were in the range between "agree" and "strongly agree," which suggested that these two rules had fairly well represented what people really did. The average score received by elimination by aspects (EBA) rule is 3.0, indicating an equal amount of "agree" and "disagree" of the respondents towards this rule. The average score received by the last statement "it was almost impossible to immigrate to other countries" was in the range of disagree, which means the majority respondents did conduct certain evaluations among alternative destinations.

Table 7.8 shows the number and percentage of respondents, by their degrees of consent to each of the three decision rules listed, where 67.8% of the respondents agreed with conjunctive rule, 63.6% agreed with addition of utilities rule and 35.5% agreed with elimination by aspects rule. Since applying any of the decision rule(s) indicates the existence of a pre-editing stage in a respondent's decision-making process, the table gives a positive indication that the majority of respondents had conducted at least some kind of pre-editing during the process by which they made their decisions on a migration destination. In order to test if the observed differences among number of respondents who fell in the categories of "Agree," "Disagree" and "Neutral" were simply due to chance variations, a χ^2 goodness-of-fit statistic was calculated for each of the decision rules. It was concluded that the differences among frequencies for the three categories in all three decision rules were significant at the .05 level (*Appendix I*). Only 5 out of the 121 respondents (4.1%) did not agree on any of the decision rules listed. Two of those indicated the reason was "it was almost impossible to immigrate to other countries." The remaining three did agree on some of the decision rules used in later stages of the decision process. It is assumed these three respondents skipped the "pre-editing" stage and went on with the rest of the process. Twenty-five (20.7%) respondents agreed with all three rules, while 72 (59.5%) agreed with two of the three rules. The findings support the suggestion that while starting the search for a destination, potential migrants did not give equal attention to every potential destination that was available to them. On the contrary, they screened the alternatives first in their minds, discarding those that had very little chance to be seen as better than others, and selecting those with some chance of becoming dominant over the others to conduct further information search. This operation involved using one or more decision rules, including either non-compensatory (CON, EBA) or compensatory (AU) rules or both. In the remaining phases of the decision-making process, the immigrants focused their attention on only those alternative destinations that had survived pre-editing and been selected for more information search.

Hypothesis 7:
Potential migrants tend to decide on a destination where at least one of their

Table 7.8: Number and percentage of respondents, by decision rules and degrees of consent to each of them

Decision rules	Agree		Disagree		Neutral		Total	
	No.	%	No.	%	No.	%	No.	%
Conjunctive	82	67.8	12	9.9	27	22.3	121	100.0
Addition of utilities	77	63.6	15	12.4	29	24.0	121	100.0
Elimination by aspects	43	35.5	38	31.4	40	33.1	121	100.0

goals of migration could be achieved while no goals could be achieved in other alternative destinations (Disjunctive rule: Table 1.1).

Hypothesis 8:
Potential migrants tend to decide on a destination where their most important goal of migration could be better achieved than in other alternative destinations (Lexicographic rule: Table 1.1).

Hypothesis 9:
Potential migrants tend to decide on a destination where at least one of their goals of migration could be better achieved while no other goals could be worse achieved than in other alternative destinations (Dominance rule: Table 1.1).

Hypothesis 10:
Potential migrants tend to decide on a destination where more important goals of migration could be better achieved than in any other alternative destinations (Addition of utilities rule: Table 1.1).

Hypothesis 11:
Potential migrants tend to decide on a destination where the number of favorable properties is more than the number of unfavorable properties as compared with any other alternative destinations (Maximizing number of attributes with a greater attractiveness rule: Table 1.1).

Hypotheses 7 to 11 are concerned with decision rules that are assumed to be related with the last three phases of the decision-making process: finding a promising alternative (disjunctive rule and lexicographic rule), dominance testing (dominance rule) and dominance structuring (maximizing number of attributes with a greater attractiveness rule and addition of utility rule). The lexicographic rule may also be associated with the operation of dominance testing when a decision is made because one alternative is superior on a very important property. Therefore, the responses to the decision rules may indicate if the decision-maker

had gone through each of the phases of the decision process (if they agreed on the rule(s) that corresponds to a certain phase) or not (if they did not agree on the rule(s) that corresponds to a certain phase).

The above decision rules were listed on Question 7 of the survey questionnaire (*Appendix D*). As in Question 6, statements about the decision rules were presented in a closed-format and scores ranging between 1 and 5 were assigned to the rules to represent the degree of consent of individual decision-makers towards each of them. Table 7.9 shows the number of respondents to and the average score received by each of the five decision rules. The higher the average score was, the better the decision rule had described the behaviors of the majority respondents. The table shows that all five rules have received average scores ranging from "agree" to "strongly agree," indicating all of them, from one way or the other, had fairly well represented what the respondents actually did during their decision-making processes.

Table 7.9: Score of importance by decision rules

Decision rule	Abbreviation	Number of responses	Average score
At least one of the goals as identified in Question 2 would be achieved in Canada while no goals could be achieved in the other countries	DIS	122	3.9
The most important goal you expected to achieve through immigration would be better achieved in Canada than in the other countries	LEX	123	3.8
One of the goals as identified in Question 2 could be better satisfied and no other goals would be worse satisfied in Canada as compared to those in the other countries	DOM	121	3.3
More goals would be better achieved in Canada than in any of the other countries	AU	121	3.3
The number of favorable properties is more than the number of unfavorable properties in Canada as compared to any other countries	MNA	121	3.5

Table 7.10 shows the number and percentage of respondents, by their different degree of consent to each of the decision rules listed in Question 7 of the survey questionnaire. The table gives a better view of how each decision rule has been evaluated by respondents, which in turn, indicates how each of the last three phases of the decision-making process had been experienced by the respondents.

The disjunctive rule (DIS) and lexicographic rule (LEX) are assumed to be the most important rules in finding a promising alternative, for both focus on the most attractive property in a decision situation. A decision-maker uses one or

Table 7.10: Number and percentage of respondents, by decision rules and degrees of consent to each of them

Decision rules	Agree		Disagree		Neutral		Total	
	No.	%	No.	%	No.	%	No.	%
Disjunctive	98	80.3	7	5.7	17	13.9	122	100.0
Lexicographic	84	68.3	11	8.9	28	22.8	123	100.0
Dominance	51	42.2	21	17.4	49	40.5	121	100.0
Addition of utilities	58	47.9	26	21.5	37	30.6	121	100.0
MNA	68	56.2	24	19.8	29	24.0	121	100.0

both rules to pick out one alternative, from what he/she has selected from the pre-editing phase, which is superior to others. Ninety-eight (80.3%) respondents agreed with DIS rule while eight-four (68.3%) agreed with LEX rule and seventy-seven (63.11%) agreed with both rules. Four people agreed with DIS rule but disagreed with LEX rule. Two agreed with LEX rule but disagreed with DIS rule. Seventeen and five people had a neutral view on LEX and DIS rule, respectively. So the total number of respondents who either agreed with DIS rule, or LEX rule, or both is 100, accounting for 81.6% of the total respondents.

The dominance rule (DOM) is the most important one in the phase of dominance testing, when decision-makers try to verify for themselves if the promising destination they chose from the last phase has any disadvantages in relation to other alternatives. However, people may also decide on the promising destination according to its most important property, rather than evaluating every property of that destination. Those properties that violate the dominance alternative could be eliminated or neutralized at a later phase. In this case, the lexicographic rule (LEX) is used. Fifty-one (42.2%) respondents agreed with DOM rule. Two respondents agreed with DOM rule but disagreed with LEX rule. Nine respondents agreed with LEX rule but disagreed with DOM rule. Forty-five respondents used both rules. Thirty and four respondents had a neutral view on DOM and LEX rule, respectively. The total number of respondents who either agreed with DOM rule, or LEX rule, or both is 86, accounting for 70.5% of the total respondents.

The phase of dominance structuring exists only with those decision-makers who have found violations of dominance. In this phase, they tried to stick to the original promising destination by de-emphasizing its unattractive properties, enhancing its positive properties, enhancing negative properties of non-promising destinations, or by adding up the attractive and unattractive properties of a destination together to do an overall comparison. Obviously, an overall comparison between alternatives involves compensatory decision rules. Table 7.10 shows, sixty-eight (56.20%) respondents agreed with the maximizing number of attributes with a greater attractiveness rule (MNA), while fifty-eight (47.93%) agreed with

the addition of utilities rule (AU). Two people agreed with MNA rule but disagreed with AU rule. Another two agreed with AU rule but disagreed with MNA rule. Forty-seven people agreed with both rules. Nineteen and nine people had a neutral view on MNA and AU rule, respectively. The total number of respondents who either agreed with MNA rule, or AU rule, or both is 70, accounting for 57.9% of the total respondents.

Again, in order to test if the observed differences among number of respondents who fell in the categories of "Agree," "Disagree" and "Neutral" in Table 7.10 were simply due to chance variations, a χ^2 goodness-of-fit statistic was calculated for each of the decision rules. It was concluded that the differences among frequencies for the three categories in all five decision rules were significant at the .05 level (*Appendix I*).

Only four respondents indicated that they did not agree with any of the five decision rules listed in Question 7 of the survey questionnaire. Two of them, as was mentioned earlier, said because it was almost impossible to emigrate to other countries. That was why they did not conduct any comparison among alternatives at all. One respondent did not score any rule higher than 3 for any of the four phases of the decision process. One agreed with CON rule for pre-editing but none of the other rules. Apparently, this person decided on Canada as soon as he found out that Canada was the only country that could possibly satisfy him with all the goals he had expected to achieve by migration. There was no other candidate for destination after pre-editing so he skipped the rest of the decision-making process to reach his final decision.

As an overview of the various decision rules used to describe migration decision-makers' way of combining and evaluating information, non-compensatory rules (except elimination by aspect rule) seem to have received more support than compensatory rules. As is shown in Table 7.7 and 7.9, during the pre-editing phase, CON rule received a higher score (3.7) than AU rule did (3.5). In the later phases, DOM rule and AU rule received the same relatively low score (3.3), while DIS rule and LEX rule received higher scores (3.9 and 3.8, respectively) than MNA rule (3.5). Looking at the number of respondents who "agreed" or "strongly agreed" with each of the decision rules as is shown in Table 7.11, the conclusion is the same. On top of the compensatory rules (AU and MNA rule), there are three non-compensatory rules (DIS, LEX, and CON rule) that had drawn consent from more respondents.

The findings in fact reveal an important fact that when people evaluate different places, they do not necessarily look for the one that generates the highest overall value or utility across all properties, as is implied by compensatory decision rules. Therefore, the assumption underlying the value-expectancy model and most micro-economic models that maximizing utility or benefit is the ultimate rule of choosing one location from several alternatives, is not verified. This is not

Table 7.11: Number of respondents who agreed with each decision rule

Decision rules	No. of respondents
DIS rule	98
LEX rule	84
CON rule	82
AU rule	77
MNA rule	68
AU rule	58
DOM rule	51
EBA rule	43

to say that people do not make compensations among different properties and do not choose the one with the highest utility at all. But the findings do indicate that maximizing place utilities may not necessarily be the most important and widely practiced rule, let along the only rule that governs people's relocation decisions.

The reason that non-compensatory rules are used more often than compensatory rules can be attributed to the computational simplicity of non-compensatory rules. When using non-compensatory rules, decision-makers do not need to be able to attach definite and consistently ordered utility and weight of importance to each property, and to make trade-off or other numerical computations which they would otherwise have to do with a compensatory rule. What the decision-makers do with non-compensatory rules is to simply look at properties in one place and see if they meet certain requirements, or one property at a time between alternatives and try to figure out in which alternative the property stands a higher value or utility.

Einhorn (1971) has pointed out two factors that might affect the possible use of different strategies in decision-making: the type of decision task and amount of information. For example, when the cost of false positive is high to the decision-maker, a conjunctive model may be used more often than a linear compensatory model, since under the former model the probability of failure because of a big drawback in a property is smaller than under the linear compensatory model. As the decision-maker is given more information on which to base his decisions—approaching an information overload condition—he would be more likely to use the nonlinear, non-compensatory models than the linear model. Other possible factors in the decision task might include: involvement of the decision-maker, amount of payoff, familiarity of the task to the decision-maker, and complexity of the task.

As was mentioned earlier, about 34% of the survey sample considered Canada as the only country to which they wanted to migrate. Therefore, they had nothing to say about using any of the decision rules in making their decision on a migration

destination. Since the respondents who avoided a choice and consequently did not agree with any decision rules had similar socio-economic and immigration backgrounds as those who did, there was no reason to assume that the earlier group had faced tougher restrictions in their choice of a migration destination so that Canada was the only one they could consider. In fact, both groups had very similar scoring pattern of the constraints of migration they had encountered. A sounder explanation for this is that those decision-makers who did not bother to compare alternative destinations settled for the first one they found satisfactory. This is a strategy that has been observed in other multiple choice situations, and those decision-makers are known as "satisficers" as opposed to "optimizers." To rewrite Simon's (1955) procedure of finding a satisfactory outcome in the context of migration, a migration decision-maker is seen (1) to search for a set of relevant properties such that the pay-off is satisfactory for all those relevant properties, (2) to gather information about properties of alternative destinations to refine their original coarse mental maps, and (3) to search for an alternative destination whose relevant properties are all satisfactory. When alternative destinations are examined sequentially, the first satisfactory alternative that is evaluated may be regarded as such as the one actually selected. The satisficing strategy leads to even more computational simplifications than non-compensatory strategies. By doing so, a decision-maker focuses on one alternative destination at a time. There is no need to compare properties across alternatives. Once a destination is found to have satisfied the minimum requirements on all its relevant properties, then a satisfactory destination is assured. Montgomery's original model of search for a dominance structure did not include the satisficing situation but assumes that all decision-makers go through the entire decision-making process and employ only maximizing strategies. Based on Simon's theory of humans as satisficers instead of maximizers and findings of this study, it is believed satisficing strategy is also an important as well as widely performed strategy in the migration decision-making processes. Therefore, the situation of satisficing was added to the decision-making process shown in Figure 7.1 on page 97 of the dissertation. The search for a dominance structure will only take place when a decision-maker cannot find a single alternative destination that is satisfactory after the pre-editing phase. Otherwise, the multi-phases decision process is cut short, jumping directly from pre-editing to the final decision of a selected destination.

In order to test how valid the four types of information search and processing methods suggested above were with regard to the information search behavior of the Chinese immigrants, four propositions were formulated representing the four methods respectively. They were listed in Question 17 of the survey questionnaire (*Appendix D*). The respondents were asked to check as many items as applicable. It appears that 168 people performed at least one type of information processing procedure listed there (Table 7.12). More than half of the respondents used what

is called a "preference search." They did not search all but only those countries for which they already had a preference. The search for information was functional for checking information that was stored in their memories, or for justifying their preferences, which is consistent with the model of search for a dominance structure. Thirty-seven and half percent of the respondents admitted that they collected only information that was readily available to them, and they did not want to spend too much time and money for what they could not get easily.

Table 7.12: Ways of information evaluation

Ways of evaluating information	Number of responses	% of total
You investigated all the conditions about one country before going to the next country	66	39.3
You investigated one condition across all countries before going to the next condition	40	23.8
You collected only information that was readily available	63	37.5
You investigated those conditions that you already had an idea for confirming or justifying	87	51.8
Others	4	2.4

As was mentioned in Chapter 5, theoretically, intra-alternative and intra-attribute search of information are compatible with the use of two groups of decision rules. More specifically, intra-alternative search corresponds to CON, AU and DIS rules, while intra-attribute search corresponds to EBA, LEX, MNA and DOM rules. The survey finding shows, 42.1% of those who agreed with any of the CON, AU, or DIS rules conducted intra-alternative search, while 41.1% of those who agreed with any of the EBA, LEX, MNA, or DOM rules conducted the same search. On the other hand, 26.3% of those who agreed with any of the CON, AU, or DIS rule conducted intra-attribute search, while 27.1% of those who agreed with any of the EBA, LEX, MNA, or DOM rules conducted the same search. Apparently, the connection between CON, AU and DIS rules and intra-alternative search, and that between the EBA, LEX, MNA and DOM rules and intra-attribute search, are not significant. The reason for the vague connections might be that the survey respondents were asked to indicate every decision rule and every information search strategy they had employed, while over 82% of them had agreed with both groups of decision rules and had conducted both information search strategies related. Those who had conducted intra-alternative search cannot be separated from those who had conducted intra-attribute search and therefore no clearer relationship between decision rules and information search strategies can be established from this survey.

In order to find out the role of external sources of information in the Chinese immigrants' decision of coming to Canada, four major types of information sources were listed in Question 15 of the survey questionnaire (*Appendix D*) and the respondents were asked to tick as many items as applicable. A total of 185 people responded to this question (Table 7.13). As is shown, "relatives and friends residing in the new countries" was the most important source of information, followed by "relatives and friends residing in the original countries." The result is consistent with former findings of migration that people use more informal than formal sources of information. At the same time, formal sources such as government immigration agencies and media also played a big part in providing information to potential migrants. The finding differs from those that were based on rural-urban migration studies, which may be attributed to the fact that the recent Chinese immigrants to Canada are better educated and have better access to formal sources of information. There was no significant difference observed among immigrants of different class, age, gender and place of last permanent residence in the way the different sources of information were consulted. The "Other" sources of information mentioned by the respondents included: "(repeated) visit to the country," "children or self had studied in the country," and "local consultant of immigration." The sources of information revealed from this survey coincide nicely with the existing literature that was presented in Chapter 4.

Table 7.13: Sources of information about new countries

Sources of information	Number of responses	% of total
Relatives and Friends residing in original country	87	47.0
Relatives and Friends residing in the other countries	117	63.2
Immigration offices in original country	56	30.3
Advertisements in newspaper, on TV, or other formal sources	50	27.0
Others	16	8.7

7.5. Conclusion

This chapter discussed the features of Montgomery's model of search for a dominance structure in human decision-making. Based on that theoretical framework, a model was built to describe the sequence of phases a migration decision-maker experiences as he/she tries to select a destination out of several alternatives. Various decision rules, both compensatory and non-compensatory, were viewed as serving various local functions of the decision process. The survey's findings supported largely the existence of this multi-phases decision-making process and the

various decision rules involved in the process of choosing a migration destination, because hypotheses 1 to 11, (except 3) were supported very well by the survey. Therefore, this study challenges the traditional idea of maximizing utility as the ultimate rule in migration decision-making. In addition, the satisficing strategy was added to the decision-making process to allow decision-makers to skip some phases of the process while still being able to reach a final decision on a destination. Furthermore, the issue of information search in migration decision-making was addressed and findings about how the Chinese immigrants acquired and evaluated information were presented. Their information search behavior further supported the idea of search for a dominance structure in migration decision-making. People belonging to different classes of immigration and age groups acquired for different amount of information, but showed very little difference in decision strategies adopted and sources of information consulted. People of different gender and last permanent residence showed very little difference in both information search behavior and decision strategies adopted.

One issue that was not discussed in this chapter but which is very closely related with the decision-making process, is the risk involved in a decision-maker's evaluation of place-related properties. In this study, potential migrants are not assumed to know exactly what would happen to them once they arrive in a new country. On the contrary, it is believed that most people make their decisions under certain degrees of risk. Exactly how migration decision-makers make their choices under the condition of risk is the major topic of the next chapter.

Chapter 8

Decision under risk in migration

The multi-phases decision-making process discussed in the last chapter assumes that individual decision-makers evaluate alternative destinations by comparing the utilities of their place-related properties. For example, such properties could include the level of income they expect to achieve, the type of occupation they will be in, their social status as members of an ethnic minority and the kind of political situation they will be facing in each potential destination. However, in most cases, decision-makers do not know for sure how those properties will actually turn out for them until they really get into and live in the new country. They are thus in a situation of lack of certainty. In Chapter 6, a brief discussion was made of the kind of internal uncertainty experienced by the recent Chinese immigrants to Canada. Over two thirds of the survey respondents cited (Table 6.7) that they were worried whether they would be able to find employment in a new country. This sense of uncertainty may stem from the inside of a decision-maker: Am I good enough to take on a job in a new country? Can I face the challenge of a new culture and environment? At the same time, it may also be caused by external factors such as the unemployment rate and job availability in the immigrant's specific area of profession in a new country. This chapter focuses on the effect of the latter type of lack of certainty, which stems from external sources influencing people's decision-making process. It is assumed that, although the immigrants did not know for certain what it would be like after migrating to another country, most of them had an opinion of how the important properties of a country would probably be once they actually moved to that country. More specifically, assuming a potential migrant is examining the expected utility of occupation in a potential destination, he/she will be able to make a judgment as to whether it is very probably, or fairly probable, or unlikely that he/she will have a much better, or worse occupation in the new country than in his/her original country. When the decision-maker is able to attach some personally viewed probabilities to the outcomes he/she expects to see after the action of migration is taken, he/she is referred to as making a decision

under risk, not pure uncertainty. Risk is an important element that runs through most human decision-making processes. The purpose of this chapter is to examine, both theoretically and empirically, how risk affects people's evaluation of single property utilities and how the involvement of risk fits into the multi-phases model of migration decision-making.

8.1. Prospect theory and some modifications

As was discussed in Chapter 2, prospect theory, a modification of expected utility theory, is relatively well suited for describing choice behaviors under risk. Therefore, it is chosen in this study as the framework within which to analyse how migration decision-makers compare properties among alternative destinations under the condition of risk. The attractiveness of a property is now defined by the term of "prospect," rather than "utility," although the two terms do not differ in nature when being referred to as a measure of goal achievement. The validity of prospect theory in migration decision-making was also tested by the empirical survey of recent Chinese immigrants. When the factor of risk is taken into consideration, migration decision-makers are assumed to evaluate the prospects of various place-related properties first. Based on the prospects of properties they will then go through the phases of the decision-making process to select a destination among several alternatives, by adopting various decision rules described in the last chapter. Evaluation of risky prospects happens mainly in the pre-editing and finding a promising destination phases. In this case, the conjunctive rule should read, for example, "choose only alternative destinations whose prospects exceed or are equal to all of a set of criteria values on the properties."

Prospect theory is built on a numerical basis. The total value of a prospect is expressed by the values and decision weights of its outcomes, which in turn, are monetary gains and losses and numerical probabilities associated with each of the outcomes. Questions have been raised with regard to the applicability of both the monetary values and numerical probabilities in a real decision situation. Therefore, a brief discussion of the two scales is needed before the theory is applied to describe migration decision-making behavior.

Two modifications are made to the prospect theory: (1) categorical terms are used instead of numerical values to represent monetary values and probility; (2) a diagram is proposed to illustrate preferences among choices.

8.1.1. Non-monetary gains and losses

The value function is the part of prospect theory that concerns utility. One big difference between the prospect theory and expected utility theory is that value judgements in a decision situation should not be seen as absolute judgements, but judgements of gains or losses in relation to a reference point. The reference point of an outcome is usually its current state. This is what people usually do when evaluating properties at a potential migration destination. An annual income of $50,000 in another city does not sound attractive if a potential migrant currently makes $70,000 a year, but will do if he/she makes $30,000 a year, assuming one of his/her goals of migration is to increase annual income. Even when migration decision-makers compare the values of the same property at two alternative destinations, they tend to refer the values in both potential destinations to its current state to give an evaluation of which one is the better. This is because an anchor, or reference point, that the decision-makers are familiar with, helps them understand better how much a change means to themselves. The magnitude, as well as the importance of the change is the value that a decision-maker is going to assign to that particular outcome in a particular alternative destination. However, the goals that a potential migrant expects to achieve vary far beyond that of monetary gains. There are many intangible properties such as quality of life, social prestige and political freedom that cannot be measured by monetary values yet greatly affect people's evaluation of a place. Therefore, it is suggested that evaluations made in relation to a reference point be expressed in broad categorical terms. The following ordered phrases **much better, better, same, worse,** and **much worse** constitute a value scale by which potential migrants evaluate the properties at a potential destination with regard to those at their current country of residence.

8.1.2. Arguments against numerical probability

Weight function explains how people react to, or distort stated numerical probabilities when they are facing risky choices. However, there is some evidence (Rapaport *et al.* 1990; Wallsten 1986) that most people generally prefer communicating their uncertain opinions with nonnumerical terms, *i.e.,* natural language rather than with numerical probabilities. For example, people would usually say "I can probably get that job," instead of "there is a 75% chance that I can get that job," or "it is doubtful that my life will be better in the United States than in Hong Kong," instead of "there is only a 30% probability that my life will be better in the United States than in Hong Kong." At least two reasons have been cited for the preference of words over numbers:

1. People understand and manipulate words better than numbers, and typically handle uncertainty (risk) by means of verbal expressions rather than numbers (Zimmer 1983), and

2. People attach a degree of precision, authority, and confidence to numerical statements, it would be misleading to represent imprecise opinions precisely. Words are perceived as more flexible and less precise, and therefore seem to be better suited to describe vague opinions and characterize imprecise beliefs (Rapaport *et al.* 1990).

Based on the above arguments, it was decided to use a set of ordered probability phrases to represent the weight scale in the study of migration decision-making behavior. Budescu *et al.* (1988) have found out that both verbal and numerical modes of judging uncertainty (risk) yielded reliable, internally consistent scales that demonstrated construct validity at the level of individual subjects. Two drawbacks of verbal comparative to numerical expressions were detected, too. One is that when considering the phrases and numbers used by multiple subjects, between-subjects variability and therefore individual differences were found much greater in the verbal model. The other one is the phrases were more vague than the numbers for each subject. In order to reduce the between-subjects variability and vagueness of using too many phrases, and to increase the internal consistency of an individual, the weight scale in this study is expressed by six groups of probability terms, where the respondents can see clearly that the groups are ordered according to their degrees of certainty, ranging from very low probability to absolutely certain. The six groups of terms are:

very low:	extremely unlikely;	
low:	somewhat doubtful;	
toss-up:	toss-up;	
high:	fairly probable,	good chance;
very high:	pretty sure,	very likely and
certain:	definitely sure.	

The headings of each group will later be shown on a diagram representing the weight scale. Besides the last group representing the certainty situation, they are actually five groups of uncertainty terms, with one indicating the 50% probability breaking point (toss-up), two groups (high, very high) more probable than this point and two groups (low, very low) less probable than that. People are not likely to confuse between terms representing certainty and uncertainty, and terms representing a higher than 50% probability and those representing a lower than 50% probability. In this way, the expressions are in natural language that people

are familiar with, while inter or within individual variabilities are reduced, too. Besides, since the interest of this study is focused on how an individual evaluates risky properties among alternative destinations rather than comparing evaluations among subjects, the first drawback does not have a big impact on the conclusions on the fitness of prospect theory.

8.2. A graphic presentation of choice preference

The prospect of any outcome is thus presented by a diagram as is shown in Figure 8.1. The value and weight scales are represented by the vertical and horizontal

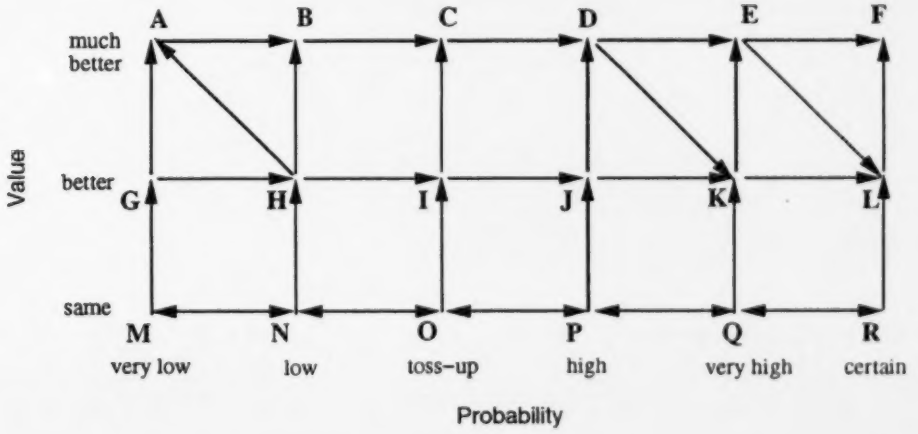


Figure 8.1: A graphic presentation of choice between risky properties (a)

axes respectively. Points A, B, ..., R represent prospects characterized by their probability and value. For simplicity's sake, all outcomes in this diagram involve only positive or zero gains, but no losses. For example, A(much better, very low) and J(better, high) represent a very low probability of getting much better in choice A, and a high probability of getting better in choice J, respectively. The arrows between any two choices indicate the direction of the preference, based on prospect theory. For example, choice J(better, high) is preferred to I(better, toss-up), choice A(much better, very low) is preferred to H(better, low), and choice M(same, very low) is equal to choice N(same, low). Comparison between any two choices in either the horizontal or the vertical dimension is easy, since there exists an obvious order among those choices with the degree of preference increasing from left to right, and from bottom to top, except when the values are the same in the decision-maker's place of origin as those in any other potential

destinations under evaluation. In that case, the decision-maker's preference of a property in an alternative is determined by chance, or he/she shows no preference of any alternatives with regard to that property and therefore that particular property does not have an effect on the decision-maker's overall preference of an alternative. Transitivity among choices is applicable, when there are arrows indicating the direction of preferences. For example, since I is preferred to H, and H is preferred to G, so I is preferred to G.

The choices on the diagram that are of most interest in this study are those indicated by diagonal lines. The preferences are based on prospect theory, and their validities are to be tested by the empirical survey of Chinese immigrants. In Figure 8.1, choice L(better, certain) is preferred to E(much better, very high) because of the certainty effect. Choice K(better, very high) is preferred to D(much better, high) and A(much better, very low) is preferred to H(better, low). This is due to the effect of overweighing relatively high probabilities and very low probabilities, respectively. In this way, comparison between any two choices can be solved by the diagram except for choices between B(much better, low) and I(better, toss-up), B(much better, low) and J(better, high), A(much better, very low) and I(better, toss-up), A(much better, very low) and J(better, high), and C(much better, toss-up) and J(better, high). Those choices (actually) reflect situations when decision-makers feel the vaguest about their preference and find it the hardest to make tradeoffs between values and weights that have subtle differences. It is assumed that decision-makers tend to avoid getting into those situations by omitting the property in their evaluations between two alternatives as soon as they find out that they do not have a clear view on which alternative is the better. What they may also do is to indicate their preferences randomly. In the latter case, the preference is not expected to be very consistent. In other words, the preference between B and I, B and J, A and I, A and J, or C and J may go either way as different decision-makers indicate their preferences. This assumption will also be tested by the empirical survey in the next section.

When considering choices in both positive and negative domains, according to the reflection effect, the graphic presentation is as shown in Figure 8.2.

8.3. Attitudes and choices by Chinese immigrants under risk

In order to verify the validity of prospect theory in describing migration decisions, testable hypotheses concerning the theory were formulated in the same way as those in the test of the model of search for a dominance structure described

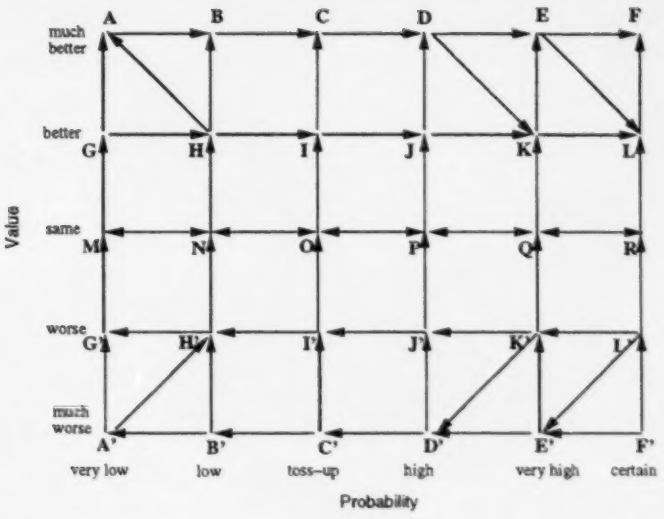


Figure 8.2: A graphic presentation of choice between risky properties (b)

in the previous chapter. Then findings from the survey of Chinese immigrants are presented to give an idea of how much those real decisions have accorded with or deviated from what was suggested by the theory. The hypotheses are postulated under two kinds of domains: comparing between two positive place-related properties (Hypotheses 12-14) and comparing between two negative place-related properties (Hypotheses 15-17).

Hypothesis 12:
Potential migrants prefer a certain outcome in a place to the one that is merely probable in another place despite the latter having a larger gain.

Hypothesis 13:
When the probability of gaining is substantial, potential migrants prefer the outcome in a place where gaining is more probable despite the fact that one in another place having a larger gain.

Hypothesis 14:
When gaining is merely possible but not probable, potential migrants prefer the outcome in a place that offers the larger gain despite the one in another place having a higher probability of gaining.

Hypothesis 15:
Potential migrants would choose to accept a high probability loss of larger value at a place rather than a certain loss of smaller value in another place.

Hypothesis 16:
When the probability of losing is substantial, potential migrants would choose to accept the outcome in a place where the outcome is less probable, despite the cost of loss involved in the outcome being greater than that in another place.

Hypothesis 17:
When losing is not very probable, potential migrants would choose a place with an even less attractive outcome where that outcome is very improbable, rather than another place with an outcome that is somewhat less unattractive, but more probable.

Question 8 to 12 of the survey questionnaire were designed specifically for the test of prospect theory (*Appendix D*). They were concerned with the evaluation of four place-related properties (conditions) in Canada and another potential destination of migration (AC) that the respondents had thought about, with regard to the conditions in the respondents' countries of origin (OC). The purpose of asking these questions was to detect how the respondents had perceived the risky conditions in two alternative migration destinations and how they had made their choices based on their evaluations. The four conditions listed, which were "living standard," "occupation," "social status" and "political stability" are generalized from the various reasons and goals for migration listed in Question 1 and 2 of the survey questionnaire. It is assumed that the four conditions covered the most important properties of a country that are frequently evaluated by migration decision-makers. Five values were assigned to represent their value judgments, where

1 = Canada (or AC) much better than OC,
2 = Canada (or AC) better than OC,
3 = Canada (or AC) the same as OC,
4 = Canada (or AC) worse than OC, and
5 = Canada (or AC) much worse than OC.

Furthermore, six values were assigned to represent their degrees of certainty about their own judgments, where

1 = definitely sure,
2 = pretty sure, very likely,
3 = fairly probable, good chance,
4 = toss-up,

5 = somewhat doubtful, and
6 = extremely unlikely.

The four conditions were treated as independent dimensions. In Question 12 of the questionnaire, the respondents were asked to indicate which potential destination they prefer with regard to each of the single dimensions, based on their evaluations of the value and degree of certainty of that dimension. Thirty-six respondents answered Questions 8 to 12.

Preferences between any two prospects characterized by their respective probability and value is the central concern of prospect theory. However, unlike those process-tracing experiments on people's choice-behavior which were related to prospect theory, this survey sample was not provided with pairs of choices with specified combinations of value and probability where the respondents' only task was to indicate which choice they preferred over the other. Instead, the sample in this study was asked to give their own evaluations on the probabilities and values of four place-related conditions in Canada and another potential destination before indicating which destination they preferred moving to. Therefore, two issues become interesting other than the final preferences given by the respondents. The first issue is how the sample population evaluated the four conditions in Canada and another potential migration destination, in terms of values and probabilities they assigned to the conditions in either destinations. How did they generally place Canada and another destination on a coordinate system such as that shown in Figure 8.2, when considering the four conditions individually? The second issue is, between what kinds of value and probability states (or prospects) were comparisons most likely to be made. Were there any particular situations where decision-makers tried to avoid making any comparisons as was suggested earlier?

8.3.1. Evaluations assigned to conditions

Responses to Questions 8–11 were presented on a series of diagrams, which shows respectively, how the evaluation of living standard (Figure 8.3), occupation (Figure 8.4), social status (Figure 8.5) and political stability (Figure 8.6) was distributed over the diagram defined by value and probability coordinates. The horizontal coordinates 1 to 6 represent probabilities that are very low, low, toss-up, high, very high and certain, respectively[1]. The vertical coordinates 1 to 5 represent

[1]The numerical values 1 to 6 show a reversed order from what were shown on the questionnaire, where 1 represented "certain" and 6 represented "extremely unlikely." Answers from the respondents are plotted according to the current coordinate system.

values that are much worse, worse, same, better, and much better, respectively[2]. A "$\star$" in Figure 8.3 represents an evaluation given to "living standard" in Canada, positioned on the diagram by its value and probability assigned by a respondent. A "." represents an evaluation given to "living standard" in another country (AC) as potential migration destination, also positioned by its value and probability assigned by a respondent. The same was done for Figure 8.4, 8.5 and 8.6. Only paired evaluations are shown. For example, a respondent might have indicated that he was pretty sure that the living standard in Canada would be better than that in his original country, but he did not compare the living standard in another potential destination with his original country. In that case, his evaluation on living standard in Canada is excluded from the analysis, since the main concern of this study is to examine how a respondent made comparisons between Canada and another country based on his/her evaluation of a condition in both countries. As a result, 33 pairs of evaluations were given to "living standard" (Figure 8.3), 33 given to "occupation" (Figure 8.4), another 33 given to "social status" (Figure 8.5) and 35 were given to "political stability" (Figure 8.6).

Figure 8.3 through Figure 8.6 show the general evaluations of Chinese immigrants of the four place-related properties in Canada and another migration destination, in terms of their values and probabilities as compared to the properties in their original countries or regions. Examination of patterns indicates that two broad types can be identified. In Figure 8.3 and Figure 8.6, the distributions of evaluations tend to cluster towards the upper right corner of the coordinate system, indicating higher probabilities and values assigned to the conditions of "living standard" and "political stability" by individual respondents. It means that the survey participants generally thought the "living standard" and "political stability" in Canada and another potential migration destination would be better than in their original countries, and they were relatively sure about their judgments. In Figure 8.4 and Figure 8.5, however, the distributions tend to move down to the lower part of the value scale and scatter further to the lower end of the probability scale. It implies that the survey respondents held diverse opinions of whether their "occupation" and "social status" in Canada and another migration destination would be better or worse than in their original countries, and they were not as sure about their judgment on these two accounts. A better way to compare among the overall tendency of two-dimensional distributions is to look at the locations of their center of gravity. Tables 8.1, 8.2, 8.3 and 8.4 show, respectively, the number of respondents who assigned probability and value to each of the four conditions in Canada as well as in another potential destination that they

[2]The numerical values 1 to 5 show a reversed order from what were shown on the questionnaire, where 1 represented "much better" and 5 represented "much worse." Answers from the respondents are plotted according to the current coordinate system.

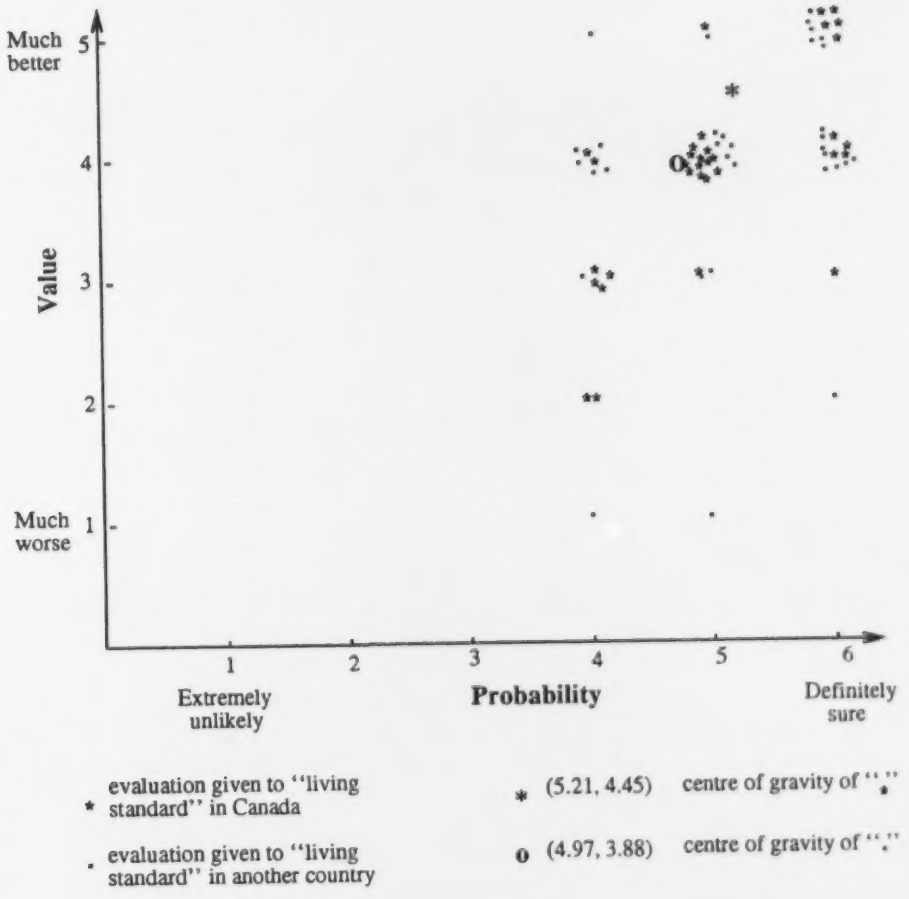


Figure 8.3: Values and probabilities given to "living standard."

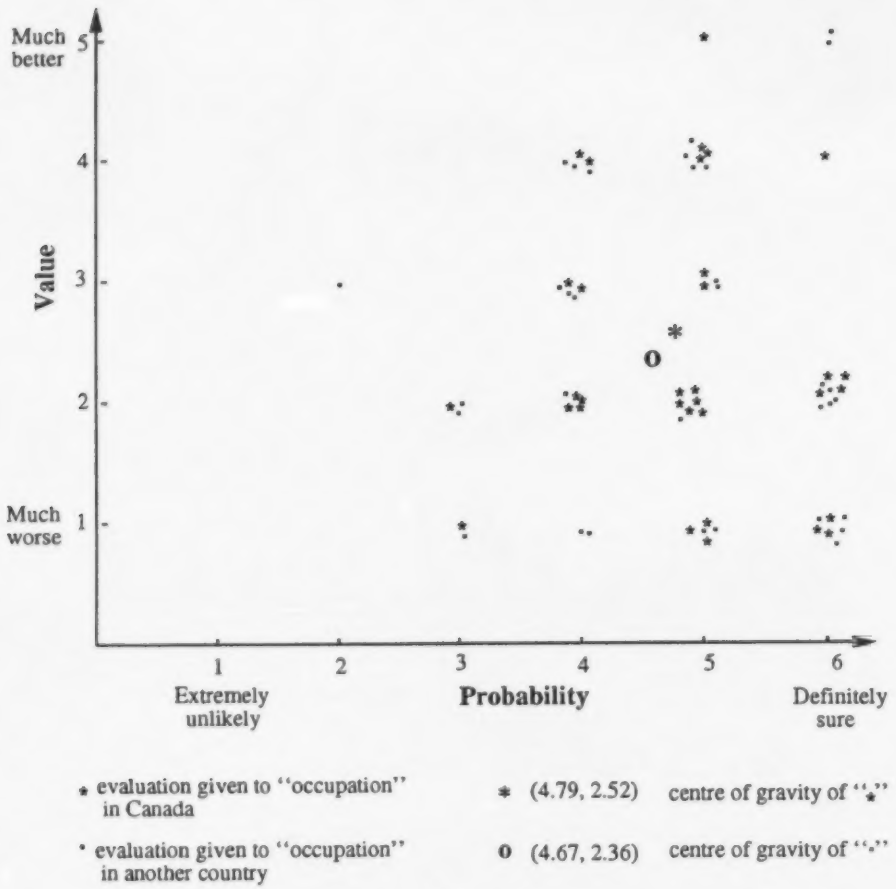


Figure 8.4: Values and probabilities given to "occupation."

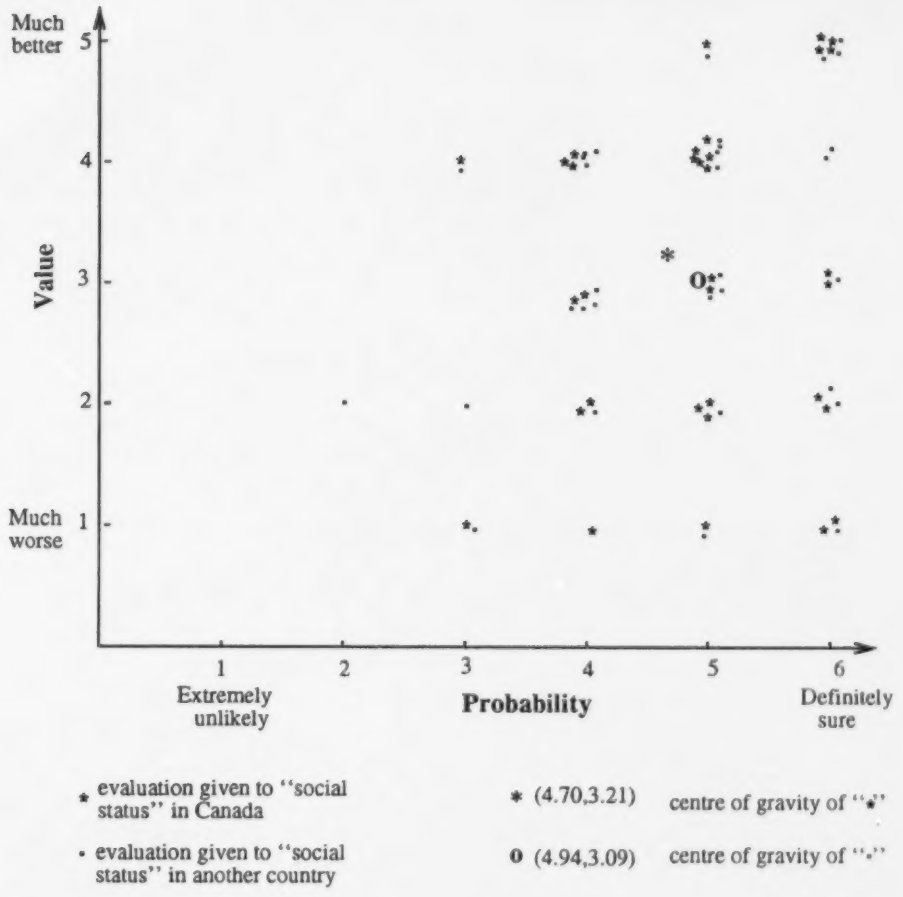
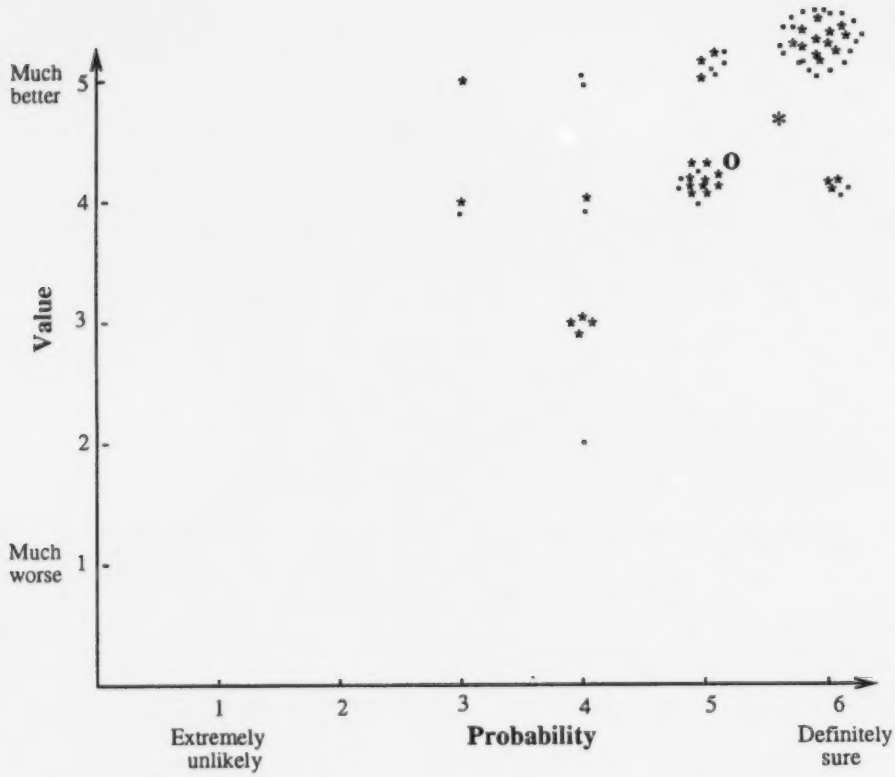


Figure 8.5: Values and probabilities given to "social status."



* evaluation given to "political stability" in Canada

* (5.46, 4.69) centre of gravity of "*"

· evaluation given to "political stability" in another country

o (5.17, 4.34) centre of gravity of "·"

Figure 8.6: Values and probabilities given to "political stability."

had evaluated. The figures in the last column of Table 8.1 and Table 8.2 are the horizontal coordinates of the centers of gravity of evaluations given to Canada and another country, respectively. Similarly, the figures in the last column of Table 8.3 and Table 8.4 are the vertical coordinates of the centers of gravity of evaluations given to Canada and another country, respectively. It is noticeable that "political stability" and "living standard" led scores in probability as well as value in both Canada and another migration destination. The probabilities were in the range between "very high" and "certain," while the values were in the range between "better" and "much better." As for "occupation" and "social status," their probabilities were generally in the range between "high" and "very high " while values were in the range between "worse" and the lower end of "better." The centers of gravity representing the sample's overall evaluation of Canada ("$*$") and another potential destination ("o") on the four conditions shown in Figures 8.3–8.6.

Table 8.1: Number of respondents assigned score of probability to conditions in Canada

Conditions	Categories of score of probability from "extremely unlikely" to "definitely sure"						Average score of probability
	1	2	3	4	5	6	
Living standard	0	0	0	8	10	15	5.2
Occupation	0	1	3	9	9	11	4.8
Social status	0	1	3	10	10	9	4.7
Political stability	0	0	1	4	8	12	5.5

Table 8.2: Number of respondents assigned score of probability to conditions in another destination

Conditions	Categories of score of probability from "extremely unlikely" to "definitely sure"						Average score of probability
	1	2	3	4	5	6	
Living standard	0	0	0	8	15	10	5.0
Occupation	0	0	1	7	15	8	4.7
Social status	0	0	2	8	13	10	4.9
Political stability	0	0	2	5	13	15	5.2

8.3.2. Comparisons and preferences between prospects

The comparisons between prospects made by the survey respondents, with regard to each of the four place-related conditions they had evaluated are presented in

Table 8.3: Number of respondents assigned values to conditions in Canada

Conditions	Categories of score of value from "much worse" to "much better"					Average value
	1	2	3	4	5	
Living standard	2	1	3	19	8	4.5
Occupation	9	9	6	7	2	2.5
Social status	3	6	9	11	4	3.2
Political stability	0	1	0	8	26	4.7

Table 8.4: Number of respondents assigned values to conditions in another destination

Conditions	Categories of score of value from "much worse" to "much better"					Average value
	1	2	3	4	5	
Living standard	0	2	6	19	6	3.9
Occupation	7	15	4	6	1	2.4
Social status	5	7	6	10	5	3.1
Political stability	0	0	4	15	16	4.4

Figures 8.7–8.10. The distribution of evaluations made by respondents are as those shown in Figures 8.3–8.6. In order not to overcrowd the figures, the distribution of those evaluations are not shown again in Figures 8.7–8.10. However, the positions where the "$\cdot$" and "$\star$" were located are represented by capital letters as those shown in Figure 8.2. A line between two choices indicates one comparison has been made between those two choices.

As is shown in Figure 8.7, 21 comparisons were made by the respondents, where 15 were between different evaluations on "living standard" in Canada and another potential destination. Those pairs of comparisons that occurred more than once include four between K and L, three between J and K, and two between F and K. Fifteen of the twenty-one preferences, accounting for 71.4% of them were found to be the same as predicted by Figure 8.2, which is the graphic representation of prospect theory.

In Figure 8.8, 26 comparisons were made with 22 being between different evaluations on "occupation" in Canada and another potential destination. L' and F' had three comparisons between themselves, and K' and E', and E' and F' had two, respectively. Among the 26 preferences, 17, accounting for 65.4% were the same as predicted by Figure 8.2.

In Figure 8.9, 19 comparisons were made with 18 being between different evaluations on "social status" in Canada and another potential destination. Only K and P received more than one comparison between themselves. Among the

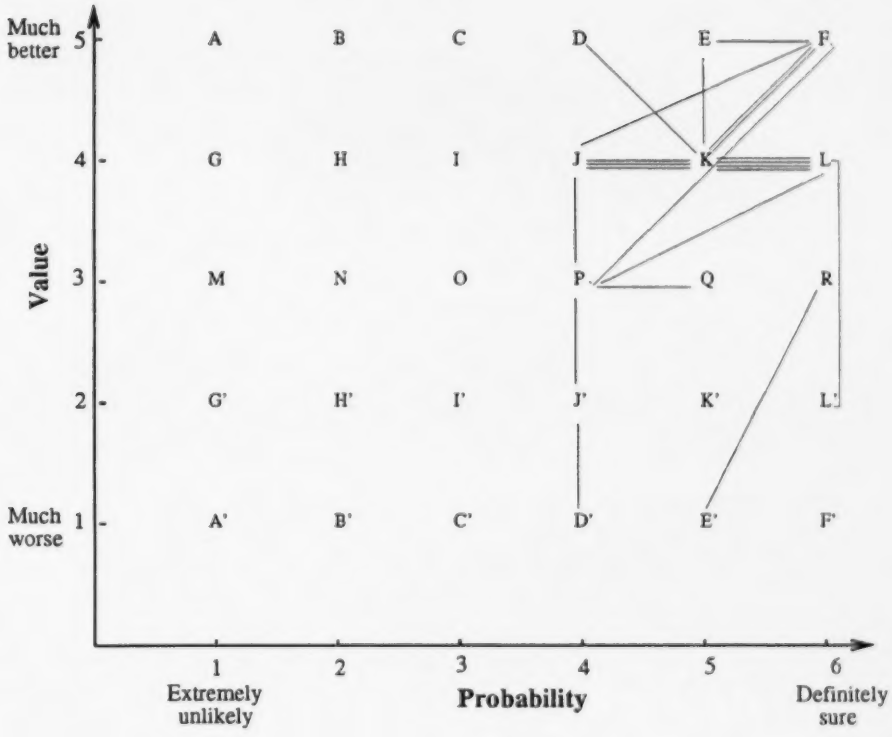


Figure 8.7: Comparisons between choices based on "living standard."

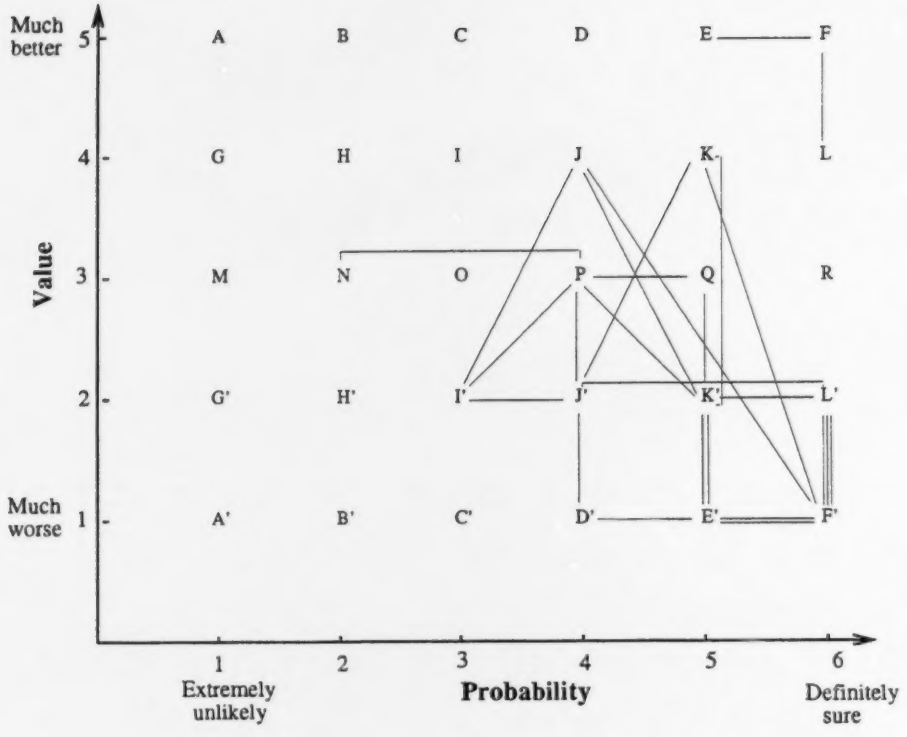


Figure 8.8: Comparisons between choices based on "occupation."

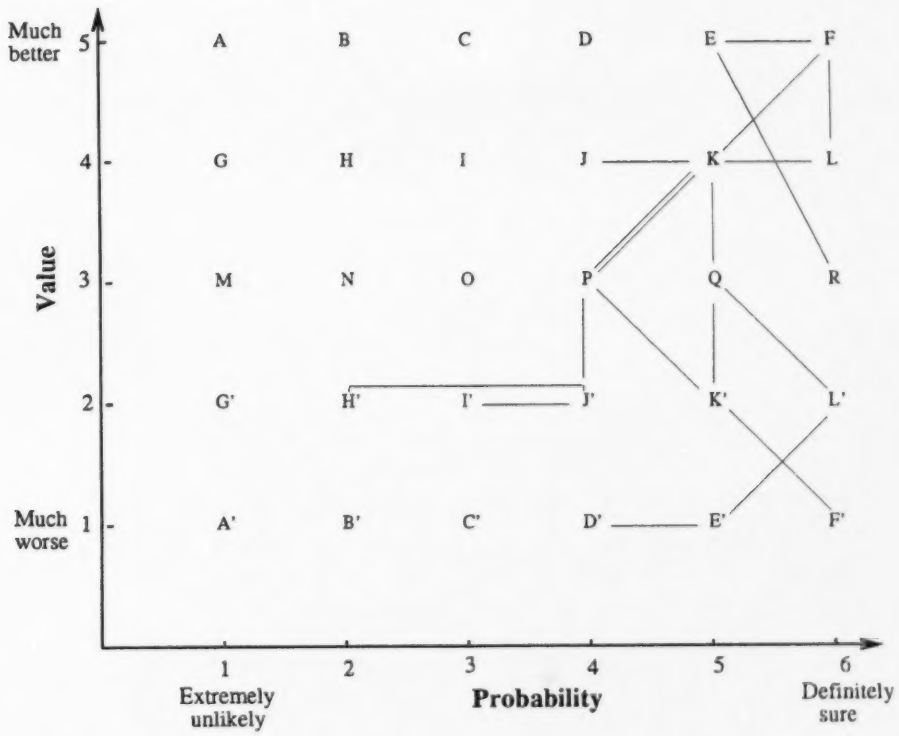


Figure 8.9: Comparisons between choices based on "social status."

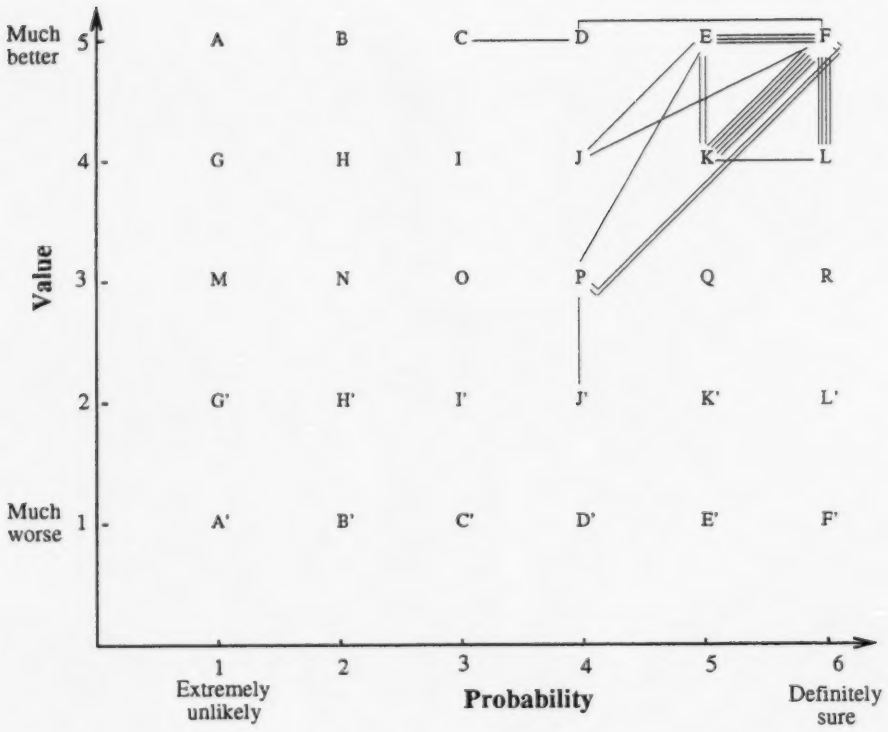


Figure 8.10: Comparisons between choices based on "political stability."

19 preferences observed, 12, accounting for 63.2% were the same as predicted by Figure 8.2.

In Figure 8.10, 23 comparisons were made with 12 being between different evaluations on "political stability" in Canada and another potential destinations. Five comparisons occurred between F and K, four between F and L, three between F and E, and two between E and K, and F and P, respectively. Among the 23 preferences, 17, accounting for 73.9% were as predicted by Figure 8.2.

Table 8.5 shows the number and percentage of preferences given to Canada and another country as potential migration destination, based on the respondents' evaluations of each of the conditions in Canada and the other country in terms of probability and value.

Table 8.5: Preference given to Canada and another destination

Conditions	Number of preferring				Total respondents
	Canada		Another country		
	No.	%	No.	%	
Living standard	31	81.6	7	18.4	38
Occupation	21	60.0	14	40.0	35
Social status	31	86.1	5	13.9	36
Political stability	32	86.5	5	13.5	37

To summarize the preferences given by the survey respondents to the four place-related conditions, a total of 89 preferences were given between different prospects. Sixty-eight and half percent of them were correctly predicted by the graphic presentation of prospect theory as is shown in Figure 8.2.

Recall from Figures 8.3–8.6, 33 respondents assigned probabilities and values to the conditions of "living standard," "occupation," "social status" and 35 to the condition of "political stability" in Canada as well as in another potential destination. Apparently, 12 evaluations are missing from Figure 8.7, 7 from Figure 8.8, 14 from Figure 8.9 and 12 from Figure 8.10. The reason for the missing pairs is that the respondents assigned exactly the same values and probabilities to each of the conditions they evaluated in Canada and another destination. Only in four cases did the respondents indicate they did not prefer either country on that particular condition because it had the same value and probability in both countries. The remaining 41 respondents still tried to make a difference in their preferences between the two countries, even though they believed that both countries looked equally attractive (or otherwise) on a property and the property was equally likely to be that way in both countries. This choice pattern actually contradicts what was suggested in prospect theory or utility theory, which maintains that if two choices had the same value (utility) and weight (probability), then one choice should not be viewed as preferred over the other. The discrepancy

between the survey findings and the theories is believed to have resulted from the design of the survey questions, where probability and value are represented in broad categories. Therefore, subtle differences between prospects can not be detected from the returned questionnaires even if the respondents did perceive some kind of differences between the conditions in two different countries. Among the 41 preferences made between the same prospects, 34 (82.9%) were indicated as preferring Canada over another migration destination. This gives us a reason to believe that respondents did not randomly indicate their preferences between equal prospects. The only explanation is that in those 34 cases, the respondents did assign a higher prospect to Canada over another country while in the other 7 cases, the respondents did give a higher prospect to another country over Canada, only the probability and value scales were not detailed enough to allow them to show the differences. This is one of the drawbacks of the design of the study, where 30.6% (41 out of 134) of the evaluations were not adequately represented. On the other hand, still 69.4% of the evaluations were very well represented by the probability and value scales of the study design. It is believed, therefore, to have offered a better representation of the evaluations than a numerically scaled probability and value would have done.

Nobody had made any comparisons between B and I, B and J, A and I, A and J, and C and J, the situations that cannot be predicted by Figure 8.2. This might have proved a statement made earlier that people tried to avoid making comparisons under those conditions, for the differences were too subtle for the decision-makers to indicate a preference.

Very few respondents had assigned probabilities lower than "toss-up." People tended to think what was likely to happen rather than what was not likely to happen, no matter whether it would turn out for better or worse. Usually a relatively high probability of upgrading, for example, implies at the same time a relatively low probability of downgrading or staying the same, although on the survey questionnaire the respondents were not given the opportunity to indicate what they had expected to happen in the other direction. There is nothing wrong with people considering only what was likely to happen, however, it revealed another drawback of the study design, where some of the crucial choices in Figure 8.2, such as between A and H, A' and H' could not be tested. In fact, other crucial choices in Figure 8.2, including D and K, E and L, D' and K', and E' and L' were not well reflected in the returned questionnaires, either, because very few people had compared between the conditions of those prospects. In other words, hypotheses 12 through 17 could not be adequately tested from the responses. The problem with the design of the questions was observed after the first 237 survey questionnaires were sent out. Therefore, a modification of the related questions was made for the remaining people on the sampling frame in order to force them to indicate their preferences between prospects that are of the greatest interest

in this study. Questions 8 to 12 of the original questionnaire were thus replaced by a single question, which is Question 8 on the revised questionnaire (*Appendix E*). A total of 155 revised questionnaires were sent. In order to tell very small differences in probability, numerical numbers rather than probability phrases were used this time. The respondents were asked to indicate their preferences between specified prospects, even though some might be hypothetical to them. Between 68 and 80 respondents answered the choices specified in the revised question. The response rate was between 43.9% and 51.6%. It is assumed that the remaining survey respondents (ranging between 48.4% and 56.1%) who did not answer this question were those who had trouble in understanding numerical probabilities. In fact, some people did indicate on the questionnaire that they could not answer the question because they did not understand it. Fortunately, the number of the respondents who understood and answered the question was big enough for the analysis. By including both kinds of questionnaires in the analysis, the survey results could, on the one hand, give an idea how people make evaluations and comparisons by themselves in the real world. On the other hand, it shows how people make evaluations and comparisons under conditions that are specified for them.

Answers to Question 8 of the revised questionnaire are shown in Table 8.6. The phrases "much better, better, worse, much worse" represented the values assigned to the overall conditions in Canada and another potential destination compared to those in the respondents' original countries. The numerical probabilities represented the likelihood of occurrence of those value evaluations.

Table 8.6: Preference given to Canada and another destination

Canada	Another country	Number and % of preferring				Total responses
		Canada		Another country		
		No.	%	No.	%	
(better, 100%)	(much better, 80%)	73	91.3	7	8.7	80
(better, 90%)	(much better, 60%)	74	94.9	4	5.1	78
(worse, 100%)	(much worse, 80%)	35	50.0	35	50.0	70
(worse, 90%)	(much worse, 60%)	32	47.1	36	52.9	68
(much better, 1%)	(better, 2%)	46	66.7	23	33.3	69
(worse, 2%)	(much worse, 1%)	46	67.6	22	32.4	68

Hypothesis 12 and 13 have been very well supported by the result from Table 8.6. Seventy-three out of eighty (91.3%) respondents preferred a certain outcome in Canada to the one in another country that was probable, even though the value of the property in Canada was smaller than that in the other country. When probability of gaining was substantial, which was the second comparison in Table 8.6, seventy-four out of seventy-eight (94.9%) respondents preferred Canada, where

gaining was more probable even though the expected gain was larger in another country. Hypotheses 16 and 17, where overweighing very small probabilities were concerned, were also supported by the survey respondents. People were generally risk-seeking in the positive domain and risk-averse in the negative domain. As a result, when facing gains, forty-six out of sixty-nine (66.7%) respondents preferred Canada where the expected gain was larger, although the probability of gaining was smaller than in another country. When faced with losses, however, forty-six out of sixty-eight (67.6%) respondents preferred Canada over another country because the expected loss was smaller. They tried to avoid bigger losses, while at the same time they actually overweighed the 1% probability of having a bigger loss. Hypotheses 14 and 15, which were concerned with choices in the negative domain where people were supposed to be risk-seeking, did not receive as much support from the survey respondents as the other hypotheses did. Answers to the third and fourth choices in Table 8.6 do not show any dominant patterns of preferences. Half of the respondents (35 out of 70) chose to accept a risk to a loss of larger value than a sure loss of smaller value, while the other half chose the other way around. Thirty-six out of sixty-eight (52.9%) respondents chose to avoid a loss that had a higher probability in Canada, as suggested by prospect theory, even though the expected loss was smaller in Canada than in another country. After all, risk-seeking behavior in the negative domain when the probability of losing was substantially high was not greatly supported by the survey. However, this may not necessarily mean that prospect theory is invalid in describing human decision-making behaviors. The discrepancy between the theory and people's attitudes towards risk observed in the survey should rather be attributed to the nature of the risks that the decision-makers were facing under different situations. As was mentioned earlier, to most people, migrating to another country was one of the biggest decision they had to make in their lives. The decision involved tremendous costs both psychologically and financially, and therefore, the migrants did not want to make any mistakes. In that regard, it is not difficult to understand that many people became more risk-averse in making their decisions to migrate than they would be under other circumstances, such as betting with money. Especially when the probability of losing was very high, the decision-makers tended to choose the country where the expected value of loss was smaller. This finding is consistent with the risk-averse features of Chinese investors, which were revealed from existing literatures of Chinese immigration to North America (Goldberg 1985).

8.4. Conclusion

This chapter studied the immigrants' choice behavior under risky situations. It tried to present prospect theory in a graphic form and modified its numerical scales with categorical values and probability phrases. The graphic presentation of prospect theory has successfully represented nearly 70% of the evaluations of four place-related properties at alternative destinations given by the survey respondents. It has also correctly predicted 63.2% to 73.9% of the preferences of the respondents, based on their own evaluations of value and probability associated with each of the place-related properties at alternative destinations. Judging from the choices based on specified numerical probabilities, certainty effect and overweighing high probabilities in the positive domain (hypotheses 12 and 13) correctly predicted 91.3% and 94.9% of the choices made by the sample. Overweighing very small probabilities, in both positive and negative domain, successfully predicted over two thirds of the choices, respectively (hypotheses 16 and 17). The choice pattern also supported the statement that people were generally risk-averse in the positive domain and risk-seeking in the negative domain. Risk-seeking in the negative domain when the probability of losing was substantially high (hypotheses 14 and 15) only correctly predicted slightly higher than 50% of the choices. However, the lack of support to hypotheses 14 and 15 did not offer sufficient evidence to reject prospect theory. The survey findings by and large support prospect theory in describing migration decision-makers' choice behavior under risk. They further suggest that the people's lack of risk-seeking in a negative domain might have to do with the nature of the risky decision they are facing. When losing means too much to them, they would rather be risk-averse than risk-seeking.

Chapter 9

Conclusions

This research is focused on the behavioral process of migration decision-making, a relatively neglected topic in the recent migration literature. The most important theoretical contribution of the study centered on the construction of a descriptive model of individual migration decision-making, founded on the idea of search for a dominance structure. Based on the assumption that migration decision-makers acted within their bounded rationalities, the model prescribed a multi-phases process, including pre-editing, finding a promising alternative, dominance testing of promising alternative and dominance structuring, by which potential migrants acquired and processed information in their search for a migration destination. The essence of the model was that a decision process involved attempts to construct a dominance structure, which justified the choice of a tentatively chosen migration destination. To do so, it was hypothesized that potential migrants intended to pay more attention to and evaluate more positively the finally chosen destination than other potential destinations long before it was definitely chosen. The model was compatible with using various decision strategies to construct the dominance structure, and thus reflected different degrees of rationality/irrationality of individual decision-makers who adopted the different strategies.

Another important issue addressed by this study was the risks involved in the potential migrants' decision-making process. It was believed that most migration decision-makers did not know with certainty the place-related properties they were concerned with at alternative destinations. More likely, they would be able to express certain personal opinions on how probable the properties would turn out to be at alternative destinations compared to their current states once the action of migration was taken. Therefore, their evaluation of properties in potential migration destinations was made under the condition of risk. This study tried to reveal the individual perceptions of risk and the way risk affected the decisions and actions of potential migrants. Prospect theory was employed to describe how potential migrants made choices among alternative destinations under the

condition of risk.

In addition to the theoretical approach, an empirical test of the model was designed and conducted to validate the model of search for a dominance structure in chosing migration destinations and prospect theory in describing people's evaluation of risky properties in alternative destinations. A self-administered questionnaire survey was conducted between August and December 1991 in Edmonton. The sample consisted of Chinese immigrants from several Asian countries and regions, mostly from Hong Kong, who arrived in Edmonton, Alberta Canada between 1985 and 1990. Information regarding alternative destinations considered, decision rules adopted, types of information acquired, sources of information consulted, and evaluations of risky place-related properties was particularly sought. Both parametric and non-parametric statistical techniques were used in the data analysis. As a result, both the model of search for a dominance structure and prospect theory were fairly successfully verified by the survey data.

Another objective achieved through the empirical part of this study was to provide a better understanding of the target population—recent Chinese immigrants—in terms of their socio-demographic characteristics and reasons for emigration. The study revealed findings in areas such as the kinds of stress they had felt in original countries, the goals they had expected to achieve through migration, their evaluations of Canada *vs.* other alternative destinations, and their reasons for choosing Canada instead of other countries.

9.1. Summary of research findings

1. Search for a dominance structure was found to exist in most Chinese immigrants' searching for a migration destination, if the involvement of various decision rules was taken as an indication of the phases of the process gone through by the immigrants. The survey result indicated that over two thirds of the respondents conformed with at least one of the following three decision rules as they chose their candidates for migration destination: the "conjunctive," "addition of utilities," and "elimination by aspects" rules. The involvement of any of the three decision rules suggested the existence of "pre-editing." Judging from the responses regarding the rest of the decision-making process leading to the choice of Canada over other candidates, 81.6% agreed with either the "disjunctive" or "lexicographic" rule, or both, suggesting the existence of "finding a promising destination," 70.5% agreed with either the "dominance" or "lexicographic" rule, or both, suggesting the existence of "dominance testing of promising destination," and 57.9% agreed with either the "maximizing number of attributes with a greater attractiveness" or "addition of utilities" rule, or both, suggesting the existence of "dominance structuring."

2. Another indication of the existence of the search for a dominant structure might be the decision-makers' intention of sticking to the alternative that they had assumed to be the best before any information search was conducted, and to keep justifying it through the decision-making process. Only 21.9% of the migrants had picked up three or more countries as potential destinations at the beginning of the decision process. Even fewer, 12.8% of them, had conducted a serious information search of three or more countries. The majority had considered and conducted information search of two or less countries as potential destinations, accounting for 78.1% and 87.2% of the migrants, respectively. More than half of the migrants admitted that their search of information about alternative destinations involved what was called the "preference search," *i.e.,* the search of information was functional for checking information that was already stored in their memories, or for justifying their preference of a single destination.

3. Various decision strategies, including compensatory, non-compensatory and satisficing rules that were used to describe the way people combine information to make choices among alternative migration destinations, received substantial support from the survey participants. Non-compensatory rules were favored by more migrants than compensatory rules, although most of them agreed with certain non-compensatory as well as compensatory rules. For example, in terms of the amount of support drawn by each of the decision rules, the top three were non-compensatory rules, namely the "disjunctive," "lexicographic," and "conjunctive" rules, followed by two compensatory rules, which were the "maximizing number of attributes with a greater attractiveness" and "addition of utilities" rules. Besides those who had considered two or more potential destinations and conducted certain information processing that can be described by the above maximizing decision rules, 34% of the migrants considered Canada as the only possible migration destination, and their information search focused on Canada only. The concept of non-compensatory and compensatory rules is unsuitable to describe the behavior of this group of migrants because their decision-making process did not involve choosing the best one among several alternatives. The "satisficing" rule, however, explained their behavior better.

4. Most of the migrants surveyed could perceive the risks involved in their evaluation of place-related properties at alternative destinations. A graphic presentation of prospect theory defined by nonnumerical value and probability scales correctly predicted nearly 70% of the choices made by the survey participants. Judging from the choices based on numerical probabilities, the effect of certainty and overweighing high probabilities in the positive domain correctly predicted 91.3% and 94.9% of the choices, respectively, while overweighing very small probabilities in the positive and negative domain correctly predicted 66.7% and 67.6%

of the choices, respectively. The choice patterns obtained from the survey by and large supported prospect theory, which states that people are generally risk-averse in the positive domain and risk-seeking in the negative domain. Only the propositions regarding risk-seeking in the negative domain when the probability of losing was certain or substantially high, were not very successful in predicting the choices made by the survey participants. The correct choices accounted for 50.0% and 52.9%, respectively. It is believed that the observed lack of risk-seeking in the negative domain when the probability of losing was certain or very high had to do with the nature of the decision task. When the cost of losing is very high, such as in international migration, people tend to be more risk-averse than in other situations, such as betting with money in a laboratory experiment.

5. In summary, the migration decision-makers surveyed can be viewed as acting within their "bounded rationalities," because they had demonstrated a limited ability to perceive information and a limited ability to utilize information in the following way: (1) they considered only a few alternative destinations, (2) they consulted only a few sources of information, (3) their search was incomplete and biased towards what they thought was important, (4) instead of maximizing place utility, they used other less rational decision rules with non-compensatory rules used more often than compensatory rules, and (5) they were under certainty effect and overweighing high probabilities in the positive domain while evaluating risky properties in alternative destinations.

6. Migration occurred for good reasons. The decision to migrate was a combined effect of stress in original countries and goals to be achieved in a new country. Political situation and children's education topped the various factors that drove the Chinese away from their original countries or regions. Correspondingly, looking for a stable and safe political environment and better opportunities for children's education were the most important goals they had expected to achieve through migration. The source of stress that trigged the decision to emigrate came from both long term dissatisfaction with the home situation, such as the one experienced by Brunei immigrants, and specific events that had called people's attention to a real loss soon to be expected, such as the one for Hong Kong immigrants. The perception of Canada's multiculturalism, less racial discrimination, and good educational opportunities were special reasons for choosing Canada as the destination for more than 75% of the survey respondents.

9.2. Implications

9.2.1. For decision-makers

The study of how people actually make decisions could provide an important clue as to how they could improve to make better decisions. Researchers in this relatively new field of "behavioral decision theory" have learned that untrained decision-makers make equally characteristic errors, and the traditional models of how decisions should ideally be made that were developed for people to follow did not seem to help much. They also conclude that decision-making researchers need to take a detailed look at how real people make real decisions before trying to develop ways to overcome the characteristic errors of self-taught decision-makers. Russo and Schoemaker (1990) identified ten common decision-making errors, or "decision traps" as they call it, that most people make over and over again, and developed a program that can help people avoid those errors. This study of Chinese immigrants' decision-making behavior also revealed certain characteristics that coincide with the "decision traps" identified by Russo and Schoemaker. For example, 37.5% of the people surveyed indicated that they collected only information that was readily available to them and they did not want to spend too much time and money on what they could not get easily. They actually fell into what is described by Russo and Schoemaker as "Decision trap number 5: Shortsighted shortcuts" in that decision-makers rely "inappropriately on 'rules of thumb' such as implicitly trusting the most readily available information or anchoring too much on convenient facts" (Russo and Schoemaker 1990:84). For migration decision-makers, this availability heuristic might easily lead to biases in favor of countries or places that are frequently shown on TV, newspapers, and where there are other readily available information sources such as relatives and friends. However, the most easily available information might not necessarily be the most relevant and valid information and it makes people overlook other possible alternatives. As for what decision-makers should do to avoid falling into any decision traps is beyond the scope of this study. Discussion about this issue can be found in Russo and Schoemaker's study (1990).

9.2.2. For policy-makers

Nearly two thirds of the Chinese immigrants surveyed relied on relatives and friends, compared to less than one third of them on immigration offices as their major sources of information regarding migration. This points to the conclusion that if the Canadian government wants to attract more immigrants or to direct them to certain destinations, it should engage more actively in providing infor-

mation in locations where clusters of potential immigrants are currently living.

Another policy implication that can be drawn from this study is that people's perception of places greatly affect their choice of a migration destination. Racial discrimination is usually a concern for international migrants. Over 75% of the Chinese immigrants surveyed indicated that Canada's multiculturalism and less racial discrimination were the special reasons for them to come to Canada. This perception of Canada has helped attract immigrants. However, there might be other less favorable impressions that have discouraged potential migrants to come, such as the lack of a healthy business climate, high taxes and "labor unions create problems for honest capitalists in search of a buck" (Cannon 1989:217). Government immigration offices might try to alter those impressions of Canada by offering specific information regarding those issues. Strategic anchoring—mention of a statistic to encourage the listener to anchor on it (Russo and Schoemaker 1990)—might be used to influence people's perception and thus bring them to think positively about those key issues concerning their decision to migrate to Canada.

9.3. Weaknesses and limitations of the study

1. The empirical study is based on answers from real immigrants regarding their pre-move decision-making behavior. Apparently, there exists a methodological inadequacy regarding the reasons for emigration and for choosing Canada as the migration destination which might reflect the respondents' pre-move motivations. There may also be a rationalized proxy, as pointed by De Jong and Fawcett (1981). The same holds true for answers to decision rules and comparisons between alternative destinations. Even though statistical methods were introduced to check the consistency of answers and to detect difference among immigrants of different time periods, there was no guarantee that all the answers had truthfully reflected what the respondents had thought or done before they migrated to Canada. For example, some people's answers to the special reasons for choosing Canada as their migration destination might have been affected by their experiences in Canada: they might have a tendency to pick up those aspects in which they had had a nice experience and skip those in which they had had a bad experience. The same might happen to their evaluations of place-related properties in Canada and another potential destination. The psychological underpinning of the effect, as Janis and Mann (1977) pointed out, is that in a post-decisional state, people sometimes tend to use fresh rationalizations that help to play up the gains and play down the losses of their decisions so that they can feel secure about reaffirming their decisions. One way to solve the problem is to survey potential migrants before their actions are taken, which in this case could be people who have submitted

applications for immigration to Canada but have not yet left their original countries.

Another limitation of this study related to the questioning of pre-move activities, is that the way the decision rules were evaluated by the respondents cannot prove that those were exactly what they did at the time information was combined and evaluated. The rules, supported by people's answers of "strongly agree," "agree," "neutral," "disagree" or "strongly disagree," which were likely to be affected by their post-decisional rationalizations, could capture to a certain degree their activities and could be accepted as a description of people's actual behavior. However, proofs of their actual adoption of any of the rules can only be sought through process-tracing studies, as those done by Sundstroem (1987), Dahlstrand and Montgomery (1984), and Klayman (1983). In studies of migration decision-making behavior, this means that a sample of potential migrants are called together, information regarding alternative destinations is provided to them by a computer or other kinds of information display board, and the decision-makers are required to report how they have used the information at regular intervals during their decision-making process. This kind of study might be reserved as a research topic for the future.

2. The survey sample included only those who had successfully migrated to Canada and therefore there is a lack of comparison between movers and non-movers in this study. It is true that whether the applicants are able to emigrate depends on whether their education, skill, assets, or family connections meet the requirement of a receiving country. However, the way different people perceive and react to risks involved in the decision to emigrate, and the way they acquire and process information may have a direct effect on whether they would decide to emigrate, that is, to apply for immigration to the receiving country in the first place. The differences between movers and non-movers were attributed to socio-economic and demographic characteristics of the people, such as age, sex, marital status, education, occupation, and position in the family life cycle by most conventional studies. A study of the individual decision-making process will help explain why individuals who belong to the same socio-economic and demographic categories still act differently in migration. Implications can be drawn from this research as to the ways in which the attitudes towards risks and information search and processing methods may contribute to make people movers or non-movers. But to make the argument more convincing a direct comparison between those who have successfully migrated and those who have not is required.

3. The graphic representation of prospect theory formulated in this study has failed to detect perceptions of certain types of probabilities, and in turn failed as an effective tool to verify the theory by the migrants. Very few respondents

assigned probabilities lower than "toss-up." They also avoided making tradeoffs between value and probability. That is why questions designed to test prospect theory had to be modified on the survey questionnaire, by introducing hypothetical prospects and asking respondents to specify their choices. It might be true that the respondents' evaluation of properties based on value phrases and nonnumerical probability terms were their true thoughts. It might also be true that those categories were not detailed enough to let the respondents express subtle differences they had perceived between risky properties in different potential destinations. When they could not find the categories that could represent their exact perceptions of value or probability, they selected nearby categories, which ended up with either no difference or a bigger difference than they actually thought. Apparently, a better representation is needed in order to test prospect theory in the context of nonmonetary values and nonnumerical probabilities.

4. Pre-test of the survey questionnaire in the stage of study design was informal and a larger test was necessary. Due to time and financial restrictions, only fifteen subjects were selected for the test. They were graduate students attending the University of Alberta who recently came from foreign countries, mostly from China, Hong Kong and Singapore. The problem with verifying prospect theory using Question 8-12 of the original questionnaire (*Appendix D*) could have been detected if a larger pre-test had been conducted.

9.4. Major issues for further studies

In addition to the issues discussed in the last section that have not been successfully accomplished in this study, the following are also important issues and deserve further study:

1. An adequate measure of the degree of stress or dissatisfactions experienced by migration decision-makers in their place of origins, and the strength of their motivation for migration. The measure will enable between-subjects comparisons of the degree of stress, as well as motivation for migration. Only after such a measure is constructed can further research be pursued on the next two issues.

2. The relationship between the degree of stress in place of origin, motivation for migration and decision strategies adopted by a decision-maker in order to choose a migration destination from possible alternatives. Janis and Mann proposed in their "Conflict model of decision-making," that a moderate degree of stress stemming from feelings of uncertainty about the

outcome "induces a vigilant effort to scrutinize the alternative courses of action carefully and to work out a good solution" (Janis and Mann 1977:51). Similarly, stress stemming from dissatisfaction of original place and motivation for migration might also initiate a "vigilant information process" by which the decision-makers will try to adopt the best decision strategies to achieve the best decisions.

3. The relationship between the degree of stress in place of origin, motivation for migration and the amount of information collected by a decision-maker about alternative migration destinations. It is reasonable to assume that when decision-makers are under no pressure at all, they tend to take the relocation decision lightly and therefore do not care if they have collected enough information or if they have missed any important information regarding the move. On the other hand, if decision-makers are under great pressure, they tend to overlook information and dismiss proper procedures in order to make quick decisions. There should be a point—a certain degree of stress and motivation—at which decision-makers are motivated to collect the largest amount and best quality of information to ensure them the best decisions. Again, empirical studies are needed to verify the proposition.

4. The effect of personal traits (*e.g.,* age, level of education, occupation, class of immigration) and society and cultural norms (*e.g.,* different cultural backgrounds of immigrants) on the decision strategies and patterns of information acquisition and process adopted.

5. The time elapses between the first thought of seeking a new location and the actual decision on a certain migration destination. How it affects the way of acquiring, the quality of, and the cost of information?

6. The role of information in reducing the degree of risk and uncertainty perceived by migration decision-makers. Is there a direct relationship between the amount of information collected by the decision-makers and their perceptions of the place-related properties under evaluation, in terms of their values (utilities) and probabilities of occurrence?

7. Replication of the test on other data sets. The migration decision model of search for a dominance structure is meant to be applicable not only in international migration, but also other types of migration. As long as the movements of the migrants have been a purposive, voluntary matter and the possible alternative destinations are known, the processes of choosing one final destination are essentially the same except that the variables under consideration may be different among different types of moves. In order to further confirm that the theoretical model is true, tests against data on

inter-regional, rural-urban, intra-urban and job-related migrations need to be conducted.

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Appendix A

Table of critical values of χ^2

	Probability under H_0 that $\chi^2 \geq$ chi square											
df	.95	.90	.80	.70	.50	.30	.20	.10	.05	.02	.01	.001
1	.0039	.016	.064	.15	.46	1.07	1.64	2.71	3.84	5.41	6.64	10.83
2	.10	.21	.45	.71	1.39	2.41	3.22	4.60	5.99	7.82	9.21	13.82
3	.35	.58	1.00	1.42	2.37	3.66	4.64	6.25	7.82	9.84	11.34	16.27
4	.71	1.06	1.65	2.20	3.36	4.88	5.99	7.78	9.49	11.67	13.28	18.46
5	1.14	1.61	2.34	3.00	4.35	6.06	7.29	9.24	11.07	13.39	15.09	20.52
6	1.64	2.20	3.07	3.83	5.35	7.23	8.56	10.64	12.59	15.03	16.81	22.46
7	2.17	2.83	3.82	4.67	6.35	8.38	9.80	12.02	14.07	16.62	18.48	24.32
8	2.73	3.49	4.59	5.53	7.34	9.52	11.03	13.36	15.51	18.17	20.09	26.12
9	3.32	4.17	5.38	6.39	8.34	10.66	12.24	14.68	16.92	19.68	21.67	27.88
10	3.94	4.86	6.18	7.27	9.34	11.78	13.44	15.99	18.31	21.16	23.21	29.59
11	4.58	5.58	6.99	8.15	10.34	12.90	14.63	17.28	19.68	22.62	24.72	31.26
12	5.23	6.30	7.81	9.03	11.34	14.01	15.81	18.55	21.03	24.05	26.22	32.91
13	5.89	7.04	8.63	9.93	12.34	15.12	16.98	19.81	22.36	25.47	27.69	34.53
14	6.57	7.79	9.47	10.82	13.34	16.22	18.15	21.06	23.68	26.87	29.14	36.12
15	7.26	8.55	10.31	11.72	14.34	17.32	19.31	22.31	25.00	28.26	30.58	37.70
16	7.96	9.31	11.15	12.62	15.34	18.42	20.46	23.54	26.30	29.63	32.00	39.29
17	8.67	10.08	12.00	13.53	16.34	19.51	21.62	24.77	27.59	31.00	33.41	40.75
18	9.39	10.86	12.86	14.44	17.34	20.60	22.76	25.99	28.87	32.35	34.80	42.31
19	10.12	11.65	13.72	15.35	18.34	21.69	23.90	27.20	30.14	33.69	36.19	43.82
20	10.85	12.44	14.58	16.27	19.34	22.78	25.04	28.41	31.41	35.02	37.57	45.32

Source: (Siegel 1956)

Appendix B

Classes of immigrants

There are three basic classes of immigrants—the family class, Convention refugees, and independent immigrants which include all immigrants who apply on their own initiative (Employment and Immigration Canada 1989b).

1. Family class—the class of immigrants made up of close relatives of a sponsor in Canada.
2. Convention refugee—anyone who fits the following UN definition: "any person who, by reason of a well-founded fear of persecution for reasons of race, religion, nationality, membership in a particular social group or political opinion, (a) is outside the country of his nationality and is unable or, by reason of such fear, is unwilling to avail himself of the protection or that country, or, (b) not having a country of nationality, is outside the country of his former habitual residence and is unable, or by reason of such fear, is unwilling to return to that country."
3. Independent immigrants
    - Assisted relatives—immigrants, other than members of the family class, with close kin in Canada willing to help them become established in this country.
    - Entrepreneurs—an immigrant who intends and has the ability to establish, purchase or make a substantial investment in a business or commercial venture in Canada that will make a significant contribution to the economy and whereby employment opportunities will be created or continued in Canada for one or more Canadian citizens or permanent residents, other than the entrepreneur and his dependents.

- Investors—a person with a proven track record in business who has an accumulated net worth of at least $500,000 who makes an investment as required in a project which has been assessed by the province as being of significant benefit to its economy, and which will contribute to the creation or continuation of employment opportunities for Canadian citizens or permanent residents.
- Self-employed—an immigrant who intends to establish a business in Canada that will create employment for that person, or who will contribute to the cultural and artistic life of Canada.
- Retiree—an immigrant who is at least 55 years of age and does not intend to seek or accept employment in Canada.

Appendix C

An introduction to the telephone survey

Hello. I am calling from the University of Alberta. We are doing a survey about recent Chinese immigrants to Canada. Would you mind my asking you a few very short questions?

1. Are you an (or any member of your family) immigrant of Chinese background?
2. In which year did you come to Canada?
3. Are you an independent immigrant (including Entrepreneur & self employed, investor, assisted relative or other independent)?
4. My last question is: Would you like to fill out a survey questionnaire that contains some questions about how you made your decision on immigrating to Canada? The questionnaire will be mailed to you in the next few days with a stamped return envelope. It is a pure academic study that has nothing to do with government organizations. The information in your returned questionnaire will be kept confidential and anonymous.

Appendix D

Survey questionnaire

I. Questions about Migration Motivation

1. There are various reasons why people want to leave their home country. How important were each of the following to you? (Circle one number for each reason)

Reasons	Of no importance		Of some importance		Of great importance
Crowded living conditions	1	2	3	4	5
Inadequate housing	1	2	3	4	5
Inadequate income	1	2	3	4	5
Inadequate educational facilities for self	1	2	3	4	5
Inadequate educational facilities for children	1	2	3	4	5
Lack of suitable employment	1	2	3	4	5
Lack of opportunity for advancement in job	1	2	3	4	5
Unpleasant climate	1	2	3	4	5
Desire for adventure or different life/culture	1	2	3	4	5
Close relatives or friends all going abroad	1	2	3	4	5
Political stability and freedom	1	2	3	4	5
Other reasons: (Please specify:)					

2. Most people expect to achieve certain goals through migration. How important were each of the following to you by immigrating to Canada? (Circle one number for each goal)

Goals	Of no importance				Of great importance
Making good money, high standard of living	1	2	3	4	5
Easy & comfortable life, more leisure time	1	2	3	4	5
Comfortable housing	1	2	3	4	5
Opportunity of getting good education	1	2	3	4	5
Having a prestigious job	1	2	3	4	5
Honor of family, being looked up to in community	1	2	3	4	5
Children have better education	1	2	3	4	5
New lifestyle, doing new things	1	2	3	4	5
Join family members, near friends or relatives	1	2	3	4	5
Political security, free to say and do what you want	1	2	3	4	5
Other reasons: (Please specify:)					

3. What were the major constraints that made it difficult for you to move to another country? (Tick as many as applicable)

   [ ] Difficulty in obtaining an immigration visa.

   [ ] Financial cost of moving.

   [ ] Afraid of being away from family or friends.

   [ ] Afraid of being unable to find a job in the new country.

   [ ] Not sure what would happen to you in the new country.

   [ ] Other reasons: (Please specify: _____).

   [ ] No constraints.

II. Questions about Making a Choice Out of Several Alternatives

4. What countries did you consider moving to before you made up your mind to come to Canada? (Tick as many as applicable)

   [ ] Canada.

   [ ] U.S.

   [ ] U.K.

   [ ] Australia.

   [ ] Other countries (Please specify: _____).

   If the answer is Canada only, please go to Question 14.

5. What countries had you really researched for information about immigration? (Tick as many as applicable)

   [ ] Canada.

   [ ] U.S.

   [ ] U.K.

   [ ] Australia.

[ ] Other countries (Please specify: _____).

If the answer is Canada only, please go to Question 14.

6. Please circle the number that best describes your opinion of each of the following statements. They are concerned with why you searched information about the above countries:

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Those countries could possibly satisfy you with all the goals you expected to achieve as identified in Q.2 by immigration	1	2	3	4	5
Those countries could possibly offer the greatest sum of attractiveness even though you are not satisfied with all the characteristics of those countries	1	2	3	4	5
The other countries couldn't satisfy you with the most important goals you expected to achieve through immigration	1	2	3	4	5
It was almost impossible to immigrate to other countries	1	2	3	4	5
None of the above, but (Please specify:)					

7. Please circle the number that best describes your opinion of each of the following statements. They are concerned about the reasons you finally chose Canada instead of the other countries:

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
At least one of the goals as identified in Question 2 would be achieved in Canada while no goals could be achieved in the other countries	1	2	3	4	5
The most important goal you expected to achieve through immigration would be better achieved in Canada than in the other countries	1	2	3	4	5
One of the goals as identified in Question 2 could be better satisfied and no other goals would be worse satisfied in Canada as compared to those in the other countries	1	2	3	4	5
More goals would be better achieved in Canada than in any of the other countries	1	2	3	4	5
The number of favorable properties is more than the number of unfavorable properties in Canada as compared to any other countries	1	2	3	4	5
None of the above, but (Please specify:)					

8. Please recall how you compared the following conditions in Canada with those in your original country (OC) before you immigrated to Canada, and then circle the number that best describes your evaluation of each of the conditions:

Conditions	Canada much better than OC	Canada better than OC	Canada the same as OC	Canada worse than OC	Canada much worse than OC	Didn't compare Canada with OC
Living Standard	1	2	3	4	5	6
Occupation	1	2	3	4	5	6
Social Status	1	2	3	4	5	6
Political Stability	1	2	3	4	5	6

If all your answers are "6", please go to Question 14.

9. How sure were you about your judgements in Question 8? Please circle the number that best describes your degree of certainty with regard to each of your above evaluations:

Conditions	Definitely sure	Pretty sure, Very likely	Fairly probable, Good chance	Toss-Up	Somewhat doubtful	Extremely unlikely
Living Standard	1	2	3	4	5	6
Occupation	1	2	3	4	5	6
Social Status	1	2	3	4	5	6
Political Stability	1	2	3	4	5	6

10. Please recall how you compared the following conditions in another country (AC) (another candidate of your immigration destination) with those in your original country (OC) before you immigrated to Canada, and then circle the number that best describes your evaluation of each of the conditions:

Conditions	AC much better than OC	AC better than OC	AC the same as OC	AC worse than OC	AC much worse than OC	Didn't compare AC with OC
Living Standard	1	2	3	4	5	6
Occupation	1	2	3	4	5	6
Social Status	1	2	3	4	5	6
Political Stability	1	2	3	4	5	6

If all your answers are "6", please go to Question 14.

11. How sure were you about your judgements in Question 10? Please circle the number that best describes your degree of certainty with regard to each of your above evaluations:

Conditions	Definitely sure	Pretty sure, Very likely	Fairly probable, Good chance	Toss-Up	Somewhat doubtful	Extremely unlikely
Living Standard	1	2	3	4	5	6
Occupation	1	2	3	4	5	6
Social Status	1	2	3	4	5	6
Political Stability	1	2	3	4	5	6

12. Based on your judgement and degree of certainty with regard to the above four conditions in Canada and another country (AC), which of the two countries would you prefer moving to if the four conditions were considered individually?

1. For living standard, you would prefer immigrating to
   [ ] Canada; [ ] AC.
2. For occupation, you would prefer immigrating to
   [ ] Canada; [ ] AC.
3. For social status, you would prefer immigrating to
   [ ] Canada; [ ] AC.
4. For political stability, you would prefer immigrating to
   [ ] Canada; [ ] AC.

13. Specific reasons for choosing Canada instead of other countries as immigration destination: (Tick as many as applicable)
    [ ] Canadian citizenship for security.
    [ ] Easier to be granted immigration.
    [ ] Language is no barrier in Canada or at least in certain Canadian cities.
    [ ] Multicultural society, easier to survive as new immigrants.
    [ ] Good investment environment.
    [ ] Career-related; advancement in job.
    [ ] High income, high standard of living (comfortable life and housing).
    [ ] Good social welfare (health insurance and old-age pension).
    [ ] Good opportunity of getting higher education for self or for children.
    [ ] Relatives or friends in Canada.
    [ ] Canada was not the first choice.
    [ ] Other reasons: (Please specify: _____).

III. Questions about Information Search Behavior

14. How long did it take for you to decide on applying for immigration to Canada since you started thinking of leaving your original country?

    Years _____ Months _____.

15. Through what sources had you searched for information about the countries you wanted to immigrate?
    [ ] Relatives and Friends residing in original country.
    [ ] Relatives and Friends residing in the other countries.
    [ ] Immigration offices in original country.
    [ ] Advertisements in newspaper, on TV, radio, or other formal sources.
    [ ] Others (Please specify: _____).

16. What kind of information had you searched for before coming to Canada? (Tick as many as applicable)
    [ ] Investment opportunity.
    [ ] Job opportunity.
    [ ] Salary.

[ ] Climate.

[ ] Housing condition.

[ ] Social Welfare (job security; health care; *etc.*).

[ ] Educational opportunity for children & self.

[ ] Political and racial atmosphere.

[ ] Possibility of being granted immigration.

[ ] Others (Please specify: _____).

17. If you searched for the above information for Canada as well as for other countries, the ways you evaluated the information were: (Tick as many as applicable)

[ ] You investigated all the conditions you were concerned about one country before going to the conditions for the next country.

[ ] You investigated one condition across all countries you thought about immigrating to before going to the next condition.

[ ] You collected only information that was readily available to you and did not want to spend too much time and money on those that you couldn't get easily.

[ ] You investigated those conditions that you already had an idea, for the purpose of confirming or justifying the information that was yet stored in your memory.

IV. Questions about Personal Information

18. In which year and from which country did you immigrate to Canada?

Year _____ Country _____.

19. Which immigration class were you in?

[ ] Entrepreneurs & self employed.

[ ] Investor.

[ ] Assisted relatives.

[ ] Other Independents.

[ ] Others (Please specify:_____).

20. Which of the following age group are you in?

[ ] $\leq$ 19 [ ] 20-35 [ ] 36-50 [ ] $\geq$ 50

21. You are a:

[ ] Male [ ] Female

22. You are

[ ] Never married (single) [ ] Married [ ] Separated, divorced, or widowed

Appendix E

A modified version of survey questionnaire

I. Questions about Migration Motivation

1. There are various reasons why people want to leave their home country. How important were each of the following to you? (Circle one number for each reason)

Reasons	Of no importance		Of some importance		Of great importance
Crowded living conditions	1	2	3	4	5
Inadequate housing	1	2	3	4	5
Inadequate income	1	2	3	4	5
Inadequate educational facilities for self	1	2	3	4	5
Inadequate educational facilities for children	1	2	3	4	5
Lack of suitable employment	1	2	3	4	5
Lack of opportunity for advancement in job	1	2	3	4	5
Unpleasant climate	1	2	3	4	5
Desire for adventure or different life/culture	1	2	3	4	5
Close relatives or friends all going abroad	1	2	3	4	5
Political stability and freedom	1	2	3	4	5
Other reasons: (Please specify:)					

2. Most people expect to achieve certain goals through migration. How important were each of the following to you by immigrating to Canada? (Circle one number for each goal)

Goals	Of no importance		Of some importance		Of great importance
Making good money, high standard of living	1	2	3	4	5
Easy & comfortable life, more leisure time	1	2	3	4	5
Comfortable housing	1	2	3	4	5
Opportunity of getting good education	1	2	3	4	5
Having a prestigious job	1	2	3	4	5
Honor of family, being looked up to in community	1	2	3	4	5
Children have better education	1	2	3	4	5
New lifestyle, doing new things	1	2	3	4	5
Join family members, near friends or relatives	1	2	3	4	5
Political security, free to say and do what you want	1	2	3	4	5
Other reasons: (Please specify:)					

3. What were the major constraints that made it difficult for you to move to another country? (Tick as many as applicable)

   [ ] Difficulty in obtaining an immigration visa.

   [ ] Financial cost of moving.

   [ ] Afraid of being away from family or friends.

   [ ] Afraid of being unable to find a job in the new country.

   [ ] Not sure what would happen to you in the new country.

   [ ] Other reasons: (Please specify: _____).

   [ ] No constraints.

II. Questions about Making a Choice Out of Several Alternatives

4. What countries did you consider moving to before you made up your mind to come to Canada? (Tick as many as applicable)

   [ ] Canada.

   [ ] U.S.

   [ ] U.K.

   [ ] Australia.

   [ ] Other countries (Please specify: _____).

5. What countries had you really researched for information about immigration? (Tick as many as applicable)

   [ ] Canada.

   [ ] U.S.

   [ ] U.K.

   [ ] Australia.

[ ] Other countries (Please specify: _____).

6. Please circle the number that best describes your opinion of each of the following statements. They are concerned with why you searched information about the above countries:

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Those countries could possibly satisfy you with all the goals you expected to achieve as identified in Q.2 by immigration	1	2	3	4	5
Those countries could possibly offer the greatest sum of attractiveness even though you are not satisfied with all the characteristics of those countries	1	2	3	4	5
The other countries couldn't satisfy you with the most important goals you expected to achieve through immigration	1	2	3	4	5
It was almost impossible to immigrate to other countries	1	2	3	4	5
None of the above, but (Please specify:)					

7. Please circle the number that best describes your opinion of each of the following statements. They are concerned about the reasons you finally chose Canada instead of the other countries:

Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
At least one of the goals as identified in Question 2 would be achieved in Canada while no goals could be achieved in the other countries	1	2	3	4	5
The most important goal you expected to achieve through immigration would be better achieved in Canada than in the other countries	1	2	3	4	5
One of the goals as identified in Question 2 could be better satisfied and no other goals would be worse satisfied in Canada as compared to those in the other countries	1	2	3	4	5
More goals would be better achieved in Canada than in any of the other countries	1	2	3	4	5
The number of favorable properties is more than the number of unfavorable properties in Canada as compared to any other countries	1	2	3	4	5
None of the above, but (Please specify:)					

8. The following questions are concerned about making a decision when you are not very sure about the countries you want to immigrate to. Assuming you were evaluating the overall conditions in Canada and another country (another candidate of your immigration destination). Here "better" or" worse" means

better or worse than in your original country. (better, 100%) means better for sure; (better, 80%) means 80% probability of getting better and 20% probability of staying the same as in the original country, and so forth. Please indicate, under the following six situations, which of the two countries you would prefer moving to. (The questions might be hypothetical, but please try to answer them all.)

1. Canada (better, 100%); Another country (much better, 80%)
   Would you prefer immigrating to Canada? [ ] Yes; [ ] No.
2. Canada (better, 90%); Another country (much better, 60%)
   Would you prefer immigrating to Canada? [ ] Yes; [ ] No.
3. Canada (worse, 100%); Another country (much worse, 80%)
   Would you prefer immigrating to Canada? [ ] Yes; [ ] No.
4. Canada (worse, 90%); Another country (much worse, 60%)
   Would you prefer immigrating to Canada? [ ] Yes; [ ] No.
5. Canada (much better, 1%); Another country (better, 2%)
   Would you prefer immigrating to Canada? [ ] Yes; [ ] No.
6. Canada (worse, 2%); Another country (much worse, 1%)
   Would you prefer immigrating to Canada? [ ] Yes; [ ] No.

9. Specific reasons for choosing Canada instead of other countries as immigration destination: (Tick as many as applicable)
   [ ] Canadian citizenship for security.
   [ ] Easier to be granted immigration.
   [ ] Language is no barrier in Canada or at least in certain Canadian cities.
   [ ] Multicultural society, easier to survive as new immigrants.
   [ ] Good investment environment.
   [ ] Career-related; advancement in job.
   [ ] High income, high standard of living (comfortable life and housing).
   [ ] Good social welfare (health insurance and old-age pension).
   [ ] Good opportunity of getting higher education for self or for children.
   [ ] Relatives or friends in Canada.
   [ ] Canada was not the first choice.
   [ ] Other reasons: (Please specify: _____).

III. Questions about Information Search Behavior

10. How long did it take for you to decide on applying for immigration to Canada since you started thinking of leaving your original country?

    Years _____ Months _____.

11. Through what sources had you searched for information about the countries you wanted to immigrate?
    [ ] Relatives and Friends residing in original country.

[ ] Relatives and Friends residing in the other countries.

[ ] Immigration offices in original country.

[ ] Advertisements in newspaper, on TV, radio, or other formal sources.

[ ] Others (Please specify: _____).

12. What kind of information had you searched for before coming to Canada? (Tick as many as applicable)

[ ] Investment opportunity.

[ ] Job opportunity.

[ ] Salary.

[ ] Climate.

[ ] Housing condition.

[ ] Social Welfare (job security; health care; *etc.*).

[ ] Educational opportunity for children & self.

[ ] Political and racial atmosphere.

[ ] Possibility of being granted immigration.

[ ] Others (Please specify: _____).

13. If you searched for the above information for Canada as well as for other countries, the ways you evaluated the information were: (Tick as many as applicable)

[ ] You investigated all the conditions you were concerned about one country before going to the conditions for the next country.

[ ] You investigated one condition across all countries you thought about immigrating to before going to the next condition.

[ ] You collected only information that was readily available to you and did not want to spend too much time and money on those that you couldn't get easily.

[ ] You investigated those conditions that you already had an idea, for the purpose of confirming or justifying the information that was yet stored in your memory.

IV. Questions about Personal Information

14. In which year and from which country did you immigrate to Canada?

Year _____ Country _____.

15. Which immigration class were you in?

[ ] Entrepreneurs & self employed.

[ ] Investor.

[ ] Assisted relatives.

[ ] Other Independents.

[ ] Others (Please specify:_____).

16. Which of the following age group are you in?

[ ] $\leq$ 19 [ ] 20-35 [ ] 36-50 [ ] $\geq$ 50

17. You are a:

[ ] Male [ ] Female

18. You are

[ ] Never married (single) [ ] Married [ ] Separated, divorced, or widowed

Appendix F

Covering letter for mailed questionnaire

Dear Sir/Madam,

As part of my PhD dissertation research at the University of Alberta, I am conducting a survey of some of the opinions and experiences of Hong Kong immigrants to Canada in recent years. The general purpose of this project is to find out how people make their decisions on choosing a country as their migration destination, and why they chose Canada instead of other countries. Very little is known about these issues and therefore any information that can be gathered will be important in leading to an understanding of them.

I would very much appreciate your co-operation in completing the enclosed questionnaire and returning it to me in the stamped envelope.

The information you give is completely confidential and there is no way your answers could be traced to you. No government agency is involved and individual information will not be available at any time to anyone but myself.

When this research is completed I shall be preparing a summary report of it which will be made available to any interested participants of the study. Thank you very much for your interest and assistance.

Yours Sincerely,

Yihua Yuan

Appendix G

Follow-up letter for mailed questionnaire

Dear Sir/Madam,

I would like to take this opportunity to thank you for agreeing to participate in our study of recent Chinese immigrants to Canada. I would also like to express my deep gratitude to those who have already returned their questionnaires. Meanwhile, this letter serves as a reminder to those people who haven't returned their questionnaires. We believe that everyone's opinion and experience are valuable and important to this study. Therefore, if you have already returned your questionnaire, please ignore this appeal and accept my thanks for your assistance. If you haven't sent back the questionnaire, I would greatly appreciate if you could do so in the next few days.

My telephone numbers are: 492-0363 and 434-0133. Please feel free to contact me if you need another questionnaire (in case the last one is missing), or have any questions pertaining to this survey.

Again, thank you very much for your co-operation.

Yours Sincerely,

Yihua Yuan

Appendix H

χ^2 tests of responses, by periods of immigration

Test of Question 2: Scores given to reasons of immigration

Period of	Reasons of emigration										Total
	I		II		III		IV		V		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	235.7	244	315.4	303	69.3	71	68.4	73	110.1	108	799
1987-88	675.6	673	904.1	907	198.8	196	196.1	191	315.5	323	2290
1989-91	842.6	837	1127.5	1137	247.9	249	244.5	245	393.5	388	2856
Total		1754		2347		516		509		819	5945

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 1.73;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(5-1) = 8$$

Reference to Appendix A reveals that a value of 1.73 is smaller than 15.51, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they evaluated the importance of various reasons of immigration.

Test of Question 3: Scores given to constraints of immigration

Period of	Constraints of immigration										Total
	visa		cost		family		job		uncertain		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	9.1	8	6.0	7	7.8	10	14.8	12	10.3	11	48
1987-88	28.0	24	18.3	17	24.0	25	45.2	47	31.6	34	147
1989-91	40.9	46	26.7	27	35.1	32	66.1	67	46.1	43	215
Total		78		51		67		126		88	410

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 3.57;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(5-1) = 8$$

Reference to Appendix A reveals that a value of 3.57 is smaller than 15.51, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they evaluated the constraints of immigration.

Test of Question 6: Scores given to decision rules

Period of	Decision rules								Total
	CON		AU		EBA		Only		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	39.6	39	37.8	34	32.6	32	29.0	34	139
1987-88	186.5	198	178.1	176	153.8	154	136.5	127	655
1989-91	217.9	207	208.1	214	179.6	180	159.5	164	765
Total		444		424		366		325	1559

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 3.51;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(4-1) = 6$$

Reference to Appendix A reveals that a value of 3.51 is smaller than 12.59, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they adopted the decision rules listed in Question 6 of the questionnaire.

Test of Question 7: Scores given to decision rules

Period of	Decision rules										Total
	DIS		LEX		DOM		AU		MNA		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	46.0	48	45.2	47	38.6	38	41.0	34	40.2	44	211
1987-88	206.4	206	202.5	210	173.0	172	183.8	176	180.4	182	946
1989-91	223.6	222	219.4	210	187.4	189	199.2	214	195.4	190	1025
Total		476		467		399		424		416	2182

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 4.03;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(5-1) = 8$$

Reference to Appendix A reveals that a value of 4.03 is smaller than 15.51, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they adopted the decision rules listed in Question 7 of the questionnaire.

Test of Question 8: Scores given to conditions in potential destinations

Period of	Evaluation of conditions								Total
	I		II		III		IV		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	5.2	6	7.2	6	5.9	4	2.7	5	21
1987-88	47.9	46	67.2	63	54.5	64	25.4	22	195
1989-91	48.9	50	68.6	74	55.6	48	25.9	27	199
Total		102		143		116		54	415

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 6.81;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(4-1) = 6$$

Reference to Appendix A reveals that a value of 6.81 is smaller than 12.59, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they evaluated conditions listed in Question 8 of the questionnaire in the potential destinations.

Test of Question 9: Scores given to degree of certainty about conditions in potential destinations

Period of	Evaluation of conditions								Total
	V		VI		VII		VIII		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	5.5	8	6.0	5	6.1	4	4.4	5	22
1987-88	35	34	38.1	39	39.0	42	27.9	25	140
1989-91	38.5	37	41.9	42	42.9	42	30.7	33	154
Total		79		86		88		63	316

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 2.96;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(4-1) = 6$$

Reference to Appendix A reveals that a value of 2.96 is smaller than 12.59, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they stated the degree of certainty listed in Question 9 of questionnaire about their evaluations of conditions in potential destinations.

Test of Question 10: Scores given to conditions in potential destinations

Period of	Evaluation of conditions								Total
	IX		X		XI		XII		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	0.6	2	1.0	0	0.9	0	0.5	1	3
1987-88	28.3	25	51.2	52	43.7	48	25.8	24	149
1989-91	39.1	41	70.8	71	60.4	57	35.7	37	206
Total		68		123		105		62	358

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 7.22;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(4-1) = 6$$

Reference to Appendix A reveals that a value of 7.22 is smaller than 12.59, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they evaluated conditions listed in Question 10 of the questionnaire in the potential destinations.

Test of Question 11: Scores given to degree of certainty about conditions in potential destinations

Period of	Evaluation of conditions								Total
	XIII		XIV		XV		XVI		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	1.0	2	1.0	0	1.1	0	0.9	2	4
1987-88	27.5	30	29.6	31	30.8	30	27.1	24	115
1989-91	39.5	36	42.4	42	44.2	46	38.9	41	165
Total		68		73		76		67	284

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij} - E_{ij})^2}{E_{ij}} = 5.59;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(4-1) = 6$$

Reference to Appendix A reveals that a value of 5.59 is smaller than 12.59, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they stated the degree of certainty listed in Question 11 of the questionnaire about their evaluations of conditions in potential destinations.

Test of Question 13: Scores given to specific reasons of immigrating to Canada

Period of	Specific reasons											
	I		II		III		IV		V		VI	
immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}
1985-86	10.2	9	7.5	6	8.6	7	11.0	12	1.7	4	3.3	6
1987-88	39.3	39	29.1	31	33.2	36	42.6	41	6.6	7	12.7	12
1989-91	46.5	48	34.4	34	39.2	38	50.4	51	7.7	5	15.0	13
Total		96		71		81		104		16		31

Period of	Specific reasons										Total
	VII		VIII		IX		X		XI		
immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	4.6	6	10.3	12	10.7	8	9.1	7	1.0	1	78
1987-88	17.6	17	39.7	38	41.4	43	35.2	35	3.7	2	301
1989-91	20.8	20	47.0	47	48.9	50	41.7	44	4.4	6	356
Total		43		97		101		86		9	735

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{k}\frac{(O_{ij}-E_{ij})^2}{E_{ij}} = 11.69;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(11-1) = 20$$

Reference to Appendix A reveals that a value of 11.69 is smaller than 31.41, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they stated the specific reasons of immigrating to Canada listed in Question 13 of the questionnaire.

Test of Question 15: Scores given to sources of information

Period of	Sources of information								Total
	Old country		New country		immi. office		media		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	9.3	6	12.4	15	6.0	6	5.3	6	33
1987-88	33.2	36	44.3	45	21.4	23	19.1	14	118
1989-91	44.5	45	59.3	56	28.6	27	25.6	30	158
Total		87		116		56		50	309

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{k}\frac{(O_{ij}-E_{ij})^2}{E_{ij}} = 4.58;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(4-1) = 6$$

Reference to Appendix A reveals that a value of 4.58 is smaller than 12.59, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they stated their sources of information.

Test of Question 16: Scores given to specific reasons of immigrating to Canada

Period of	Types of information									
	I		II		III		IV		V	
immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}
1985-86	6.2	7	16.6	16	11.0	15	12.7	14	14.6	13
1987-88	18.4	19	49.2	51	32.7	30	37.6	37	43.2	45
1989-91	24.4	23	65.2	64	43.3	42	49.7	49	57.2	57
Total		49		131		87		100		115

Periods of	Types of information								
	VI		VII		VIII		IX		Total
immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	14.7	19	16.4	14	13.7	12	16.0	12	122
1987-88	43.6	40	48.5	5	40.6	41	47.3	47	361
1989-91	57.7	57	64.2	64	53.7	55	62.7	67	478
Total		116		129		108		126	961

$$\chi^2 = \sum_{i=1}^{r}\sum_{j=1}^{k}\frac{(O_{ij}-E_{ij})^2}{E_{ij}} = 5.95;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(9-1) = 16$$

Reference to Appendix A reveals that a value of 5.95 is smaller than 26.30, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the types of information listed in Question 16 of the questionnaire.

Test of Question 17: Scores given to ways of evaluating information

Period of	Ways of evaluating information								Total
	I		II		III		IV		
Immigration	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	E_{ij}	O_{ij}	
1985-86	8.5	8	5.2	8	8.1	5	11.2	12	33
1987-88	25.0	20	15.2	14	23.9	26	33.0	37	97
1989-91	32.5	38	19.7	18	31.0	32	42.8	38	126
Total		66		40		63		87	256

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{k} \frac{(O_{ij}-E_{ij})^2}{E_{ij}} = 6.28;$$

Significance level: let $\alpha = 0.05$;

$$df = (k-1)(r-1) = (3-1)(4-1) = 6$$

Reference to Appendix A reveals that a value of 6.28 is smaller than 12.59, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we fail to reject H_0. We conclude that there is no significant difference among immigrants of three time periods in the way they evaluated information listed in Question 17.

Appendix I

χ^2 tests of agreement with decision rules

Conjunctive rule (Table 7.8)

Frequency	Agree	Disagree	Neutral	Total
Observed	82	12	27	121
Expected	48.4	48.4	24.2	121

$\chi^2 = \sum \frac{(O_k - E_k)^2}{E_k} = 51.0;$

Significance level: let $\alpha = 0.05$;

$df = k - 1 = 2$

Reference to Appendix A reveals that a value of 51.0 is larger than 5.99, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we reject H_0. We conclude that there is significant difference among the number of people who fell in "Agree," "Disagree" and "Neutral" with regard to the conjunctive rule.

Addition of utilities rule (Table 7.8)

Frequency	Agree	Disagree	Neutral	Total
Observed	77	15	29	121
Expected	48.4	48.4	24.2	121

$\chi^2 = \sum \frac{(O_k - E_k)^2}{E_k} = 40.9;$

Significance level: let $\alpha = 0.05$;

$df = k - 1 = 2$

Reference to Appendix A reveals that a value of 40.9 is larger than 5.99, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we reject H_0. We conclude that there is significant difference among the number of people who fell in "Agree," "Disagree" and "Neutral" with regard to the addition of utilities rule.

Elimination by aspects rule (Table 7.8)

Frequency	Agree	Disagree	Neutral	Total
Observed	43	38	40	121
Expected	48.4	48.4	24.2	121

$$\chi^2 = \sum \frac{(O_k - E_k)^2}{E_k} = 13.2;$$

Significance level: let $\alpha = 0.05$;

$$df = k - 1 = 2$$

Reference to Appendix A reveals that a value of 13.2 is larger than 5.99, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we reject H_0. We conclude that there is significant difference among the number of people who fell in "Agree," "Disagree" and "Neutral" with regard to the elimination by aspects rule.

Disjunctive rule (Table 7.10)

Frequency	Agree	Disagree	Neutral	Total
Observed	98	7	17	122
Expected	48.8	48.8	24.4	122

$$\chi^2 = \sum \frac{(O_k - E_k)^2}{E_k} = 87.7;$$

Significance level: let $\alpha = 0.05$;

$$df = k - 1 = 2$$

Reference to Appendix A reveals that a value of 87.7 is larger than 5.99, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we reject H_0. We conclude that there is significant difference among the number of people who fell in "Agree," "Disagree" and "Neutral" with regard to the disjunctive rule.

Lexicographic rule (Table 7.10)

Frequency	Agree	Disagree	Neutral	Total
Observed	84	11	28	123
Expected	49.2	49.2	24.6	123

$$\chi^2 = \sum \frac{(O_k - E_k)^2}{E_k} = 54.7;$$

Significance level: let $\alpha = 0.05$;

$$df = k - 1 = 2$$

Reference to Appendix A reveals that a value of 54.7 is larger than 5.99, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we reject H_0. We conclude that there is significant difference among the number of people who fell in "Agree," "Disagree" and "Neutral" with regard to the lexicographic rule.

Dominance rule (Table 7.10)

Frequency	Agree	Disagree	Neutral	Total
Observed	51	21	49	121
Expected	48.4	48.4	24.2	121

$$\chi^2 = \sum \frac{(O_k - E_k)^2}{E_k} = 41.1;$$

Significance level: let $\alpha = 0.05$;

$$df = k - 1 = 2$$

Reference to Appendix A reveals that a value of 41.1 is larger than 5.99, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we reject H_0. We conclude that there is significant difference among the number of people who fell in "Agree," "Disagree" and "Neutral" with regard to the dominance rule.

Addition of utilities rule (Table 7.10)

Frequency	Agree	Disagree	Neutral	Total
Observed	58	26	37	121
Expected	48.4	48.4	24.2	121

$$\chi^2 = \sum \frac{(O_k - E_k)^2}{E_k} = 19.0;$$

Significance level: let $\alpha = 0.05$;

$$df = k - 1 = 2$$

Reference to Appendix A reveals that a value of 19.0 is larger than 5.99, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we reject H_0. We conclude that there is significant difference among the number of people who fell in "Agree," "Disagree" and "Neutral" with regard to the addition of utilities rule.

MNA rule (Table 7.10)

Frequency	Agree	Disagree	Neutral	Total
Observed	68	24	29	121
Expected	48.4	48.4	24.2	121

$$\chi^2 = \sum \frac{(O_k - E_k)^2}{E_k} = 21.2;$$

Significance level: let $\alpha = 0.05$;

$$df = k - 1 = 2$$

Reference to Appendix A reveals that a value of 21.2 is larger than 5.99, which is the minimum value of χ^2 to reject H_0 at $\alpha = 0.05$. Therefore, we reject H_0. We conclude that there is significant difference among the number of people who fell in "Agree," "Disagree" and "Neutral" with regard to the maximizing number of attributes with a greater attractiveness rule.